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No. 39

11 Annual Report
of the
Association of Ontario
Land Surveyors 11

Organized 1886

Incorporated 1892

41924

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PETERBOROUGH, ONT

And Proceedings of the Thirty-second Annual Meeting
Since Incorporation. Held at Toronto,
Feb. 19th, 20th, and 21st, 1924.

NOTICES

The Annual Meeting of the Association is fixed by statutes and is held on the third Tuesday in February.

Copies of Annual Reports for the past years can be supplied by applying to the Secretary. Price, \$1.00.

Members will please look up names of chairmen of various committees and inform them of any interesting matter pertaining to that branch of the profession which may come to their notice or write to the Secretary.

Our library is now located at the Toronto Engineers' Club, 96 King St. West, and has been consolidated with the libraries of other associations in that building. Members have free and full access to all books in the consolidated library.

Published by Association of Ontario Land Surveyors. This edition 800 copies ; price, \$1.00.

PREFACE

To the Members of the Association of Ontario Land Surveyors:

The Proceedings of the Association at its Thirty-second Annual Meeting are herewith presented.

Respectfully submitted on behalf of the Council.

T. D. leMAY,
Secretary.

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Association of Ontario Land Surveyors

Organized 23rd February, 1886. Incorporated 1892.

Past Presidents

1886. George B. Kirkpatrick.	1905. J. W. Tyrrell.
1887. George B. Kirkpatrick.	1906. O. J. Klotz.
1888. Alex. Niven.	1907. Thomas Fawcett.
1889. Alex. Niven.	1908. A. J. van Nostrand.
1890. Villiers Sankey.	1909. Lewis Bolton.
1891. Villiers Sankey.	1910. H. W. Selby.
1892. Elihu Stewart.	1911. J. F. Whitson.
1893. Elihu Stewart.	1912. T. B. Speight.
1894. M. J. Butler.	1913. J. S. Dobie.
1895. M. Gaviller.	1914. J. W. Fitzgerald.
1896. Willis Chipman.	1915. E. T. Wilkie.
1897. T. Harry Jones.	1916. C. J. Murphy.
1898. P. S. Gibson	1917. James J. Mackay.
1899. H. J. Bowman.	1918. Herbert J. Beatty.
1900. George Ross.	1919. C. Fraser Aylsworth.
1901. James Dickson.	1920. T. D. leMay.
1902. W. R. Aylsworth.	1921. Geo. A. McCubbin.
1903. W. R. Aylsworth.	1922. Geo. Hogarth.
1904. C. A. Jones.	1923. H. T. Routly.

OFFICERS FOR 1923-24.

President

W. G. McGEORGE Chatham

Vice-President

L. V. RORKE Toronto

Chairman of Council

T. B. SPEIGHT Toronto

Secretary-Treasurer

T. D. leMay Toronto

Members of Council

HON. CHARLES McCRAE, Minister of Lands and Forests

E. T. WILKIE, Toronto	}	For term ending April, 1925
J. W. PIERCE, Ottawa		

JAS. J. MacKAY, Hamilton	}	For term ending April, 1926
F. N. RUTHERFORD, St. Catharines		

T. B. SPEIGHT, Toronto	}	For term ending April, 1927
E. W. NEELANDS, New Liskeard		

Auditors

D. D. JAMES Toronto
JNO. van NOSTRAND Toronto

Bankers

Bank of Montreal (Yonge and Queen Branch) Toronto

Board of Examiners

T. B. SPEIGHT (Chairman) L. V. RORKE (Secretary)

GEO. A. McCUBBIN, Chatham }
L. V. RORKE, Toronto } For 3 years

H. J. BEATTY, Pembroke }
T. D. leMAY, Toronto } For 2 years

L. B. STEWART, Toronto }
JOHN vanNOSTRAND, Toronto } For 1 year

Note.—Board meets at City Hall, Toronto, first Monday in February, 1925.

COMMITTEES, 1924-1925

LAND SURVEYING—R. M. Anderson (Chairman), E. T. Wilkie, J. S. Dobie, H. B. MacRostie, J. vanNostrand, H. H. Gibson, C. T. Smith, C. G. Reuben, R. W. Code, Oliver Smith, E. G. MacKay, L. V. Rorke.

DRAINAGE—J. J. Newman (Chairman), S. B. Code, E. D. Bolton, F. J. Ure, U. W. Christie, G. A. McCubbin, W. G. MacGeorge, F. A. Bell, J. A. Baird, J. R. Scott, O. Smith.

ENGINEERING, ROADS AND PAVEMENTS—H. W. Sutcliffe (Chairman), J. M. Empey, G. Hogarth, N. D. Wilson, J. J. MacKay, J. L. Lang, H. T. Routly, M. Brian, F. Rutherford, A. E. Jupp.

TOPOGRAPHICAL AND EXPLORATION SURVEY—J. W. Pierce (Chairman), F. J. K. Benner, J. S. Dobie, E. W. Neelands, K. G. Ross, E. P. Bowman, R. C. Purser.

ENTERTAINMENT—E. T. Ireson (Chairman), F. H. Mucklestone, A. T. Ward, A. Cook, R. M. Anderson, J. vanNostrand, C. Manser.

LEGISLATION—T. D. leMay (Chairman), J. M. Watson, H. L. Esten, G. A. McCubbin, C. F. Aylsworth, J. J. MacKay, J. S. Dobie, A. J. vanNostrand, T. B. Speight, F. N. Rutherford, Roger Lee, L. V. Rorke.

BIOGRAPHY—Willis Chipman (Chairman), H. L. Esten, J. D. Evans, V. W. Wadsworth, E. Stewart, A. R. Davis, C. E. Fitton, H. K. Weeksteed, G. A. McCubbin.

TOWN PLANNING—N. D. Wilson (Chairman), H. L. Seymour, H. T. Routly, J. J. MacKay, T. D. leMay, G. F. Summers, H. M. Anderson, N. B. MacRostie.

REPOSITORY—H. L. Esten (Chairman), A. J. vanNostrand, L. V. RORKE, N. D. Wilson, G. Hogarth.

Programme of the
Association of Ontario Land Surveyors
(Incorporated 1892)

At Its Thirty-second Annual Meeting Held at Toronto,
February 19th, 20th and 21st, 1924.

PROGRAMME

Tuesday, 19th February—10 o'clock, A.M.

Meeting of Council of Management.

Meeting of Standing and Special Committees.

2 o'clock P.M.

Reading of Minutes of previous Meeting.

Correspondence.

President's Address.

H. T. Routly, O.L.S.

Report of Secretary-Treasurer and Auditors.

Report of Committee on Land Surveying.

R. M. Anderson, O.L.S.

Paper—"Water Boundaries."

R. M. Anderson, O.L.S.

Paper—"Reafforestation as I see it in New Ontario."

E. W. Neelands, O.L.S.

Evening Session, 8 o'clock.

Reception for Members and Ladies.

Illustrated Lecture.

By Prof. A. P. Coleman, M.A., Ph.D., F.R.S.

Wednesday, 20th February—10 o'clock A.M.

Report of Council of Management and Board of Examiners.

T. B. Speight, O.L.S., Chairman

Report of Committee on Engineering, Roads and Pavements.

F. N. Rutherford, O.L.S., Chairman

Paper—"Designing Streets for Transportation."

N. D. Wilson, O.L.S.

Report of Committee on Town Planning.

H. L. Seymour, O.L.S., Chairman

Paper—"Proposed Amendments to Town Planning
Legislation."

J. J. Mackay, O.L.S.

Paper—"A Simple Form for the Azimuth Equation."

L. B. Stewart, O.L.S.

2 o'clock P.M.

Report of Committee on Drainage.

J. J. Newman, O.L.S., Chairman

Paper—"Some Comments on the Municipal Drainage Act."

J. R. Scott, O.L.S.

Report of Committee on Legislation.

T. D. leMay, O.L.S.

Report of Committee on Topographical and Exploration
Surveys.

J. W. Pierce, O.L.S.

Report of Committee on Biography. Willis Chipman, O.L.S.

Report of Committee on Repository. H. L. Esten, O.L.S.

Evening, 7 o'clock.

Annual Dinner at Engineers' Club Dining Room. (Informal)

Thursday, 21st February—10 o'clock A.M.

Report of Committee on Entertainment.

John vanNostrand, Chairman

Nomination and Election of Officers.

Unfinished Business.

New Business.

Adjournment.

1 o'clock P.M.

Veterans' Luncheon

At Engineers' Club for all Surveyors who received their certificates prior to 1894, and all Past Presidents of the Association.



H. T. ROUTLY
President Association Ontario Land Surveyors, 1923-1924.

THE FOLLOWING MEMEBERS WERE PRESENT:

Name	Address	Name	Address
Abrey, G. S.	Toronto	Jackson, J. E.	Hamilton
Anderson, R. M. ..	Toronto	James, D. D.	Toronto
Angus, G.	North Bay	Leach, J. S.	Toronto
Ardagh, A. G.	Barrie	Lee, R. M.	Brantford
Aylsworth, C. F. ..	Madoc	leMay, T. D.	Toronto
Baird, W. J.	Toronto	Lumsden, H. D. ...	Toronto
Bartley, T. H.	Ottawa	Mackay, J. J.	Hamilton
Beatty, H. J.	Pembroke	Mackay, E. G.	Hamilton
Beatty, F. W.	Pembroke	MacRostie, N. B. ..	Ottawa
Berkeley, G. L.	Toronto	McCubbin, G. A. ...	Chatham
Bell, F. A.	St. Thomas	McGeorge, W. G. ..	Chatham
Blandy, O. R.	Hamilton	Manser, C. J.	Toronto
Bolton, E. D.	Listowel	Manton, L. G.	Toronto
Bowman, E.	Guelph	Marshall, Joseph ..	Toronto
Burwash, N. A. ...	Toronto	Miller, F. F.	Napanee
Chipman, Willis ...	Toronto	Moore, E. L.	North Bay
Christie, H. W.	Orangeville	Mucklestone, F. H..	Toronto
Code, R. S.	Mimico Beach	Nash, A. L. S.	Brantford
Code, S. B.	Smith Falls	Neelands, E. W. ...	New Liskeard
Code, R. W.	Windsor	Newman, J. J.	Windsor
Code, A.	Alvinston	Pierce, J. W.	Ottawa
Coltham, J. T.	Parry Sound	Ransom, J. T.	Toronto
Cook, A.	New Toronto	Reuben, C. G.	Toronto
Dalton, J. J.	Weston	Rorke, L. V.	Toronto
Davis, A. R.	Toronto	Routly, H. T.	Toronto
Dobie, J. S.	Thessalon	Rutherford, F. N. ..	St. Catharines
Eadie, L. F.	Toronto	Scott, J. R.	Welland
Esten, H. L.	Toronto	Seibert, F. V.	Ottawa
Empey, J. M.	St. Marys	Seymour, H. L. ...	Toronto
Evans, J. B.	Trenton	Silvester, G. E. ...	Toronto
Fitton, C. E.	Toronto	Smith, O.	Lindsay
Fitzgerald, E.	Toronto	Smith, C. T.	St. Catharines
Gray, A. W.	Brockville	Stewart, W. E.	Aylmer
Gillon, E.	Fort Francis	Stewart, L. D.	Collingwood
Griffin, C.	Toronto	Tyrrell, J. W.	Hamilton
Gibson, H. H.	Toronto	vanNostrand, John.	Toronto
Gibson, W. S.	Toronto	Wadsworth, V. ...	Toronto
Gilbert, F. A.	Toronto	Walker, A. P.	Toronto
Greenlees, A. H. ...	Toronto	Ward, A. T.	Toronto
Halford, A. J.	Toronto	Webster, F. T.	Lindsay
Hogarth, G. A.	Toronto	Wicksteed, F.	Toronto
Howard, C. J. B. ...	Toronto	Wilkie, E. T.	Toronto
Ireson, E. T.	Toronto	Wilson, N. D.	Toronto
		Yates, C.	Toronto

PRESIDENT'S ADDRESS

H. T. Routly, O.L.S.

To the Members of Ontario Land Surveyors' Association.

Gentlemen,—It is my pleasant duty to welcome you to this Thirty-second Annual Meeting of our Association, and I trust that profit and pleasure will be your reward. We acquire a liberal education from the reading of the various papers, discussion of reports and the friendly intercourse with our professional brethren. The interchange of ideas is a vital element in the continued growth and development of our Association. The attendance has been larger in recent years but there is room for improvement in this regard, and you can do no better service to your Association than by regular attendance yourself, and by drumming up the delinquents. In unity is strength, but we cannot attain unity if two-thirds of our members remain uninformed and disinterested in our objectives.

Since our last meeting, death has called several of our members, and it is fitting that we should record their passing and forward a message of sympathy and condolence to those who have been bereaved.

Peace has brought its trials and problems little less perplexing than war. There is still much unrest and misery in European countries. We should be thankful that our lot has been cast in such a land as that in which we live. Its climatic conditions demand of its people vigor, thrift, and self-reliance, but also a broader tolerance and a greater sympathy for others in distress, and so we have worked together in greater harmony for our rehabilitation. While there has been no boom in surveying, I trust that each one of you has had a fairly successful year and that prospects look bright for the coming season.

Commencing about fifteen years ago your attention has been repeatedly directed to our opportunity in the field of Highway Engineering, and one is led to speculate on the value to us of the example set by our pioneer members in this work and of the papers and discussions. It is not mere accident that when the various governing bodies have required Highway Engineers they have chosen those who bore the title of Ontario Land Surveyor. No other engineering association has given this problem such continued attention and intelligent discus-

sion. For a time the subject seemed of more academic than practical interest. We were Land Surveyors—why should we be particularly interested in Highway Engineering? I want to say, gentlemen, that those discussions did much to direct the attention of our Members to that field of work—and more than anything else, directed public attention to a body of men **qualifying** themselves for that service. And we have reason to be right proud of the part we have played in this branch of Engineering. A list of the leading Highway Engineers of our Province is but an abbreviated list of the members of this Association. I think it fitting that some record be made of our standing in this branch of Engineering, and for want of a better place, I wish to chronicle a few of the names here:

A. W. Campbell, O.L.S., Federal Commissioner of Highways, Ottawa.

W. A. McLean, O.L.S., First Deputy Minister of Highways of Ontario.

Geo. Hogarth, O.L.S., Chief Engineer, Department of Highways, Toronto.

J. H. Jackson, O.L.S., Supt. Queen Victoria Park, Niagara Falls.

C. R. Wheelock, O.L.S., Past President Ontario Good Roads Association, Orangeville, Ont.

The late J. F. Whitson, O.L.S., Organizer and first Superintendent of Colonization Roads.

The late Robt. Laird, O.L.S., Location and Construction Engineer Colonization Roads.

Chas. H. Fullerton, O.L.S., present Superintendent Colonization Roads, Toronto.

These are a few of the leaders, but there is a large additional list of Ontario Land Surveyors taking active and important parts in Highway Engineering in Ontario.

Clayton E. Bush, O.L.S.,

J. M. Empey, O.L.S.,

N. A. Burwash, O.L.S.,

R. S. Code, O.L.S.,

C. H. Meader, O.L.S.,

are with the Department of Public Highways or Colonization Roads.

H. J. Bell, O.L.S., St. Thomas,

M. E. Brian, O.L.S., Windsor,

A. M. Jackson, O.L.S., Brantford,

J. J. McKay, O.L.S., Hamilton,

W. G. McGeorge, O.L.S., Chatham,

H. D. Lumsden, O.L.S., Hamilton,
W. J. Moore, O.L.S., Pembroke,
F. N. Rutherford, O.L.S., St. Catharines,
W. W. Stull, O.L.S., Sudbury,

are a few of the names forming the still incomplete list of Ontario Land Surveyors who have achieved prominence as Highway Engineers in their localities. It is a matter of especial significance that these men have generally been retained only when the road schemes have reached such magnitude that the authorities in charge recognized the absolute need of the best trained Engineering and organizing ability.

We are now in somewhat a similar position with regard to Town Planning as we were fifteen years ago with regard to Highway Construction. A few of our members have taken a conspicuous part in the pioneer work in this field of activity. Our attention has been directed to this as a field in which the Surveyor is particularly qualified to render valuable service, and it is up to us to hold our advantage by qualifying ourselves to deal with Town Planning problems when submitted to us. There is an urgent need at present for Municipal Cooperation and adequate legislation, and the Ontario Land Surveyor is the logical educator of public opinion, and when time is ripe the logical agent to direct the work. I invite your earnest attention to the developments and possibilities in this field.

The value and influence of our Annual Meeting is shown in a remarkable way by our success in Highway Engineering. There seems to be no logical reason why we should not have developed similarly in certain other branches of Engineering. There are members of our Association who have given leadership and achieved outstanding success as Railway and Hydraulic Engineers, but little interest has been aroused in the average Surveyor. There are no doubt various reasons for this, but I believe that one of the principal ones is the absence of papers and discussions year after year at our Annual Meetings to arouse the interest and furnish instruction to our younger men in the formative stage of their professional careers, and to draw public attention to our qualifications for the work.

And this leads me to remark that when one considers the high degree of scholastic attainment required to pass our examinations—the care and precision with which we are taught to do our work—the high ideals of professional rectitude which

are inculcated—the atmosphere of judicial fairness in which we have been raised, and the actual intrinsic value to the public of the work we do—when we consider these things, how pitifully inadequate our monetary reward appears. The quality of our service to the public is woefully undervalued if our financial returns are to be taken as the measure of public esteem. We see many in other professions, in semi-professions and the various trades whose educational qualifications and professional services are in no way comparable to ours, and yet whose remuneration is greatly in excess of ours.

Why this condition? What the remedy?

To neither of these questions am I qualified to give a conclusive answer. Both are worthy of our most earnest study. Some little progress has been made in recent years, but the incomes derived by many of our members is still insufficient to enable them to take their proper place in the community. One is discouraged from many public activities by lack of income, and one cannot do one's best work professionally when haunted by constant financial worries for the bare necessities of life. What is the cause? Probably related to the nature of our work, especially in former years. It has little of the spectacular to attract public attention. Formerly it took us out of direct contact with our fellows and with the current questions of the day—and made us diffident about expressing ourselves when occasion offered. We lacked opportunity and training in dealing with the public. We lacked opportunity to organize for mutual support. And so our claims were easily set aside, and the profession has lacked the recognition in financial return to which it has been entitled. This perhaps was not an unmixed evil, because there was attracted to our profession a finer quality of men than would likely have been the case had there been a stronger monetary appeal.

Have the times changed—or have we changed—that a higher financial return is even now a desirable thing? I sincerely believe so! The surveyor is not now so essentially a man of the wilderness. His work is largely of the city, and as a good citizen he should take his place and part in the various activities of his community. And to occupy the station and discharge the duties for which he is qualified, a more ample income is necessary. Not solely for his own gratification, but because it will enable him to be of greater service and usefulness, and to that desirable end we should take all proper and legitimate steps. I submit that one of the most effective means is to render to your community the best and the most accept-

able service of which you are capable in the various departments of civic life, and so demonstrate the quality of men you are. "He profits most who serves best," and I believe that as we learn to serve there will come increased financial recognition of our professional work. Don't join in these activities just to increase your income, or you will miss the mark entirely—join because you want to be a good citizen—willing to play your part. The rest will follow—with a little encouragement. But in whatever things you do, hold hard to the high ideals which have always distinguished our Association. The character and quality of your service must never be sacrificed. It is, after all, the best and surest foundation on which to build. This charge particularly, I give the junior members and to the class of new graduates whom I bid welcome on behalf of the Association. You inherit an unsullied reputation handed down by the fathers of our Association. See to it that you leave it as high and clean as you find it.

I would risk another suggestion whereby we can improve our status and influence as an Association and thereby our personal incomes. Take more interest in the work of the Association! Attend its meetings! Participate in its discussions! Contribute papers on subjects with which you are particularly qualified to deal! In unity is strength! Pull together! Give your brother the benefit of the doubt when his character or practice is assailed. Better to err twice in his defence than be once right in his condemnation. Let us make these Annual Meetings so interesting, so instructive, and so enjoyable, that every man will want to be here and bring his wife with him.

I hope you will be pleased that the Entertainment Committee have this year extended a cordial invitation to the ladies. I hope this innovation will be so marked a success that it will become a regular part of our Annual Meeting. The programme for the ladies has been so arranged that members need not absent themselves from any of our regular sessions. I wish to officially welcome those ladies who have accepted our invitation this year and thus become the pioneers of this movement, and I trust that the provision made for their entertainment by the Entertainment and the Ladies' Committees will meet with their approval and that they will enjoy their outing and look forward to an annual repetition.

The Chairman and Members of the different Committees have given much thought and energy to the preparation of the various reports. In order for these to prove of utmost value, it is essential that a full and frank discussion follow the

reading of each report. If the junior men bring their enthusiasm and their problems; the active members their practical solutions; and the veterans their mature and cautious judgment, our discussions and findings will be of real and lasting value.

Finally, I beg to thank you for the high honor conferred upon me in choosing me to be the President of your Association. I most sincerely appreciate this expression of your confidence and esteem. Though not active in the practice of my profession in recent years, I have ever retained, and hope always to continue, a very keen interest in the aspirations and the affairs of this Association.

MINUTES OF ANNUAL MEETING OF
ASSOCIATION OF ONTARIO LAND SURVEYORS

Held at the Engineers' Club, Toronto, on the 19th, 20th and
21st of February, 1924.

2 P.M. SESSION—FEBRUARY 19.

The President—If you will come to order, gentlemen, we will open our proceedings. The first order of business is the reading of the minutes of the last meeting.

Before that is done I should explain that since our last meeting there has been a change in the office of Secretary. Mr. Rorke thought he could not very well carry on the duties, and asked us to appoint a successor, and while we all felt very sorry to lose Mr. Rorke, we feel it will be the unanimous opinion of the Association that we have been very fortunate in his successor. The duty of the Secretary-Treasurer is one that is very difficult, and a position which is not easy to fill. The Secretary-Treasurer has to be located right in the first place and has to give liberally of himself for the work and has to have a certain amount of spare time to do it or ability to find spare time, and all of us who know Mr. leMay, know the Association is very fortunate in having him as successor to Mr. Rorke.

The Secretary—Mr. Chairman, I think it would be better, and I think it is the general custom to take the minutes as read; they are in the annual report.

The President—Will some one move that we take the minutes as read?

Moved by L. V. Rorke, and seconded by E. T. Wilkie, that the minutes be taken as read.—Carried.

The President—Any correspondence, Mr. Secretary?

The Secretary—(Reads letter from Mr. McIlquham, secretary of Dominion Land Surveyors; letter from G. H. Henderson, K.C., referee under the Drainage Laws).

The President—There is nothing to do with regard to this correspondence excepting the question of filing.

The President—(Reads address, which is filed with the Secretary).

The President—We will now have the report of the Secretary-Treasurer.

Mr. Aylsworth—I notice a remark you made, and if you will allow me I would like to make a few remarks. Mr. Chairman, is it out of order? Silence gives consent. I heard the remark you made when you got up to read your address that you hoped you would feel better after you got it off your chest. I may say I have been attending these meetings for a great many years, and I only wish to congratulate you on the very logical address that you have made. It is retroactive and retrospective, and brings up a great many points that are very worthy of discussion here. There are two or three points suggested, but I do not think this is the proper time to bring them up; I am going to bring them up before the session adjourns. I wish to move a vote of thanks to you for the very able paper.

Mr. Rueben—I never like younger members to second votes of thanks, but I notice the older members do not like to get up. It may be they will be a little fatigued after their long journeys. I wish to second the vote of thanks.

The Secretary—You have heard the motion, the vote of thanks to the President.—(Applause.)

The President—I thank you, gentlemen. If anything I have mentioned is of value I am pleased to know of it and hand it on to you for consideration.

The Secretary—A statement of receipts and expenditures for the past year is submitted to you for your consideration. It will be noticed that the expenditures are considerably in excess of the revenue, and this is attributable to the cost of printing the manual and purchase of three shares of Consumers Gas Company.

Secretary read financial statement.

The President—You have heard the report of the Secretary-Treasurer. What is your pleasure?

Moved by Mr. Anderson, and seconded by Mr. McGeorge, that the report of the Secretary-Treasurer be adopted.—Carried.

The President—I might point out while the expenditures have been in excess of the revenue, part is accounted for by the transfer of cash to new stock in the Gas Company. We will now have the report of the Committee on Land Surveying by Mr. Anderson.

Mr. Aylsworth—Is the Consumers Gas Company a safe investment? I do not know. I am not criticizing because we have invested in the stock; others might know more about it than I do. I would think Government bonds and municipal bonds would be better. I would suggest they change and not put all the eggs in the one basket, and I would ask that the suggestion be considered. We have a lot of money to invest and why not put it in other things?

The President—That will be taken into account by Council when there is money to invest again.

Mr. Rorke—For the information of Mr. Aylsworth and others who do not know, several years ago this investment was made in the Consumers Gas stock, and last year the company undertook to cut a melon, and those who held stock were allowed to purchase at \$135, and the Ontario Land Surveyors felt at that time it would be a good thing to secure three new shares, and it was considered a wise policy to take them at that price. I think it was a very good investment, as long as the stock is in good condition. The suggestion of Mr. Aylsworth is very good that we should not put all the eggs in one basket, but considering we had the chance of securing the stock at that price and could have sold it next day at an advance, I think it was a good investment.

Mr. McGeorge—Was not that endorsed by the general meeting?

The President—Yes.

Mr. Anderson (Reads questions submitted and answers thereto)—I would like, and I think it would perhaps be desirable, if the meeting would pass on each of these questions individually.

Mr. Anderson—I move the committee's report be received and adopted.

Mr. Muckleston—I second the motion. Carried.

Mr. Anderson—(Reads paper “Water Boundaries”).

The President—You have heard this very interesting and valuable paper by Mr. Anderson, what is your pleasure?

Moved by Mr. Dobie, and seconded by Mr. Ardagh, that the paper read by Mr. Anderson be received and printed in the Annual Report. Carried.

The President—Before we go on to the reading of the next paper there is an announcement to be made by the Chairman of the Entertainment Committee. You will remember at the last Annual Meeting the suggestion was made that provision be made for the ladies, and the committee have had that in mind, and I will call on Mr. vanNostrand to enlighten you as to what has been done.

Mr. vanNostrand—In connection with the entertainment of the ladies an informal reception is being held at the Club here, in connection with which is a lecture by Professor Coleman, which should be very interesting. As to the programme for tomorrow, a Ladies’ Committee was appointed, and they made certain arrangements. It was decided that they visit the Museum on Bloor Street, and have a motor ride around the city and have a look at the different points of interest, and have dinner at the Prince George Hotel about 6 o’clock, and following that the remainder of the evening would be put in at the Princess Theatre. I have tickets for the dinner and for the theatre, and I would appreciate it if I could get rid of these this afternoon, or as soon as possible, so I would be able to tell how many are going to take part in the function, as unused theatre tickets must be returned. I think I have quite sufficient for those who wish to go, and probably a few extras. If the members from outside would see me before they leave I can supply them with tickets. I also have tickets for the Annual Dinner for tomorrow night for the men.

I might mention that the entertainment in connection with out-of-town ladies is complimentary; we are looking after that, so that in the case of any members who have brought their ladies to town all they have to do is apply for the tickets, and they will be supplied.

The President—I might add, gentlemen, that the Ladies' Committee would like to see as many of the ladies of the Toronto members accompany the party as possible.

We will now have Mr. Neelands' paper on Reafforestation in New Ontario.

Moved by Mr. McCubbin, and seconded by Mr. Bell, that Mr. Neelands' paper be received and printed in our minutes. Carried.

The President—We are a little ahead of time, and we might have a little time to have another paper this afternoon, and in doing so relieve a possible congestion tomorrow. But there are so many of the members who have left that I would not like to bring up any matter, it is only a little after five.

Mr. Aylsworth—If you are looking for trouble—I noticed in your own address and I told you I would bring up a couple of points I think that very materially affect our Association, our standing and our profession. At the outset I have always dismissed politics from anything I say, and I want it understood I am not going to mention politics. However, you mentioned about having a united organization, and that we should all work together and attend our annual meetings, and so forth. That is absolutely true, and as old as the hills. I saw in the paper the other day that some sixty-five engineers were given the bounce, turned out on the snow banks to eat snow and ice the best they could. Some fourteen or fifteen were taken back and the rest were allowed to rustle and browse the best as they could without any reason why they were turned out in the world. Along this line I clipped out a statement in the press the other day, that seems to bear on the question as to why everybody has a grudge against surveyors. It looks as though any time any public institution wants to cut down expenses it is the surveyor. The lawyer and the doctors can look after themselves. I do not know that I ever heard of 65 lawyers getting the bounce in one bunch; I do not know that I ever heard of the doctors or dentists or any other profession getting the bounce in the same manner. It is going on all over, but they always start on engineers and surveyors. I am not going to make any moral issues, but it behooves every surveyor and every engineer to get into an organization that will control all the influence possible to protect them in hours of this kind. It

behooves every young surveyor to take such an active part in the Association as will make it an active organization. I have no axe to grind personally. I am talking for the younger members of the Association; but to hear these different references to surveyors you would think they were a public nuisance, as though we lived in caves.

At least there is one exception to that rule. I worked for the Dominion Government for nineteen years, and resigned on my own accord. If I had remained in the position for one year longer I would have been eligible for superannuation. I did not know it. If I had known I probably would have stayed. I did not see how I could be a fixture and I think a great many other surveyors are the same way.

That is my advice for all engineers, to get in and build up an institution. I think through these institutions we may be able to feel sufficient strength that we will not be turned out of jobs and held up to public ridicule.

Everybody in Canada or Ontario knows the service the surveyors have rendered; knows the service the Dominion Land Surveyors have rendered to the Dominion at large.

The Chairman—The hour is about the usual stopping time.

Meeting adjourned till 10 a.m., February 20th, 1924.

10 A.M. SESSION

Wednesday, February 20th, 1924

The Chairman—If you will come to order we will commence our program. It has been found very difficult in the past to complete our program on time, and the special difficulty today is perhaps some of the members will not be able to get here. In regard to the report of the Management Committee, we will all be sorry to hear that Mr. Speight is confined to his house, and has been for the last few months, and will not be able to be with us. The Secretary will read the report.

The Secretary—(Reads report of Council of Management and Board of Examiners).

The Chairman—You have heard the report, what is your pleasure?

Moved by Mr. Dobie, seconded by Mr. McCubbin, that the report be adopted. Carried.

The Chairman—The next item on the program is the Report on Engineering. Mr. Rutherford has sent word he will not be here, and Mr. McKay will read the report. He was here yesterday, but he is not yet here today. We will therefore take up the next item, which is "Designing Streets for Transportation," by Mr. Wilson.

Mr. N. D. Wilson—When I was asked to give a paper before the meeting at this Session, I had in mind a paper on Designing Street Systems for Traffic. I think that is what I had in mind, but when I came here I saw on the program it was "Designing Streets for Transportation." Therefore, if I am a little bit loose in my connection in what I have to say and possibly cover too much territory, and cover things in too much detail, I ask your indulgence.

One thing I would like to say, while theory is a very able servant, it is a very, very treacherous master, particularly in regard to traffic, because statistics and such like are so very cumbersome and hard to get and dangerous to analyze; they have got to be used with a great deal of care, both in themselves, and due also to the fact as one has so very little data, even with a very large number of traffic counts, so there is very little definite data upon which to base any conclusions. Without further ado I will go ahead with the paper. I think we can all take for granted that the question of zoning is in the minds of everyone that has anything at all to do with city planning. (Reads paper, illustrated with lantern slides).

The Chairman—You have heard this very interesting and instructive paper by Mr. Wilson; we are always sure of getting something from Mr. Wilson with a great deal of meat in it. What is your pleasure?

The Secretary—Mr. President and Gentlemen—I would like to move a very hearty vote of thanks to Mr. Wilson for this valuable paper, and I will also move it be received and printed. I cannot discuss it from the standpoint of a roadway engineer. From the standpoint of town-planning I think it is a word in time. We are continually advised by town-

planning experts that a uniform system of 66 feet wide is undesirable, and that 50 feet is ample, and all that is necessary in some cases to satisfy all needs. Such points as Mr. Wilson has touched on should make it quite clear why a narrow street is going to be more trouble than the value of the land saved is worth. I have much pleasure in moving a hearty vote of thanks to Mr. Wilson.

Mr. McKay—I am pleased to second that motion. I think Mr. Wilson has certainly struck a point in the width of streets. I know Mr. Thomas, the Town Planning Advisor of Ottawa, is very strong on narrow streets, subsidiary streets as low as 40 feet, and other streets smaller. I think the fact of the heavy motor traffic of today shows the fallacy of that. I think it is a very important question.

The Chairman—You have heard the motion put by Mr. leMay and seconded by Mr. McKay, all in favor. Carried.

The Chairman—Mr. Wilson, I want to thank you personally for a paper of this kind. It follows up what I suggested yesterday, that it would be a great help to have discussions on town planning by people who are qualified to give us advice; it will be very helpful to those of our members who have any idea of following this line of work.

For the next item on our program we will revert back to the paper on Engineering, Roads and Pavements.

Mr. McKay—This was more or less prepared by the Chairman, Mr. Rutherford, and submitted yesterday to two or three of the members that are here. It may not have all the features it should refer to, and there may be some points here that may be questioned, but as it is we will give it to you as Mr. Rutherford has drafted it. (Reads paper).

This is respectfully submitted by your Committee, and I move its adoption.

Moved by Mr. McKay, seconded by Mr. Newman, that the report be received and printed. Carried.

The Chairman—The next item on the program is "Amendments to Town Planning." As Mr. McKay's paper perhaps links itself up with Mr. Seymour's report, I suggest we take these together. While waiting for Mr. Seymour we will ask Mr. Stewart to give us his paper on the "Simple Form of

Azimuth Equation." I regret very much he did not find it when I was in the School of Science.

Professor Stewart—Mr. President and Gentlemen—The subject of Azimuth is one that has cropped up so frequently I hope the members of the Association are not getting tired of it. I am working upon one or two formulae and I find them very useful, and I thought they might be useful to the members of the Association. (Reads paper, with blackboard illustrations).

Mr. Stewart—Some of you present think perhaps that the D. L. S. tables are good enough. Of course they are if you have them, but you might happen to lose them or to have them at home, or you may be so far away from civilization that they cannot be got, and if you are only depending on the tables you are in rather a bad fix. I think everybody should be able to get along with a book, and you should be qualified to locate the direction of a line, lay down a meridian line without any further help than this.

The Chairman—Any criticism that may have been made on papers in former years read at this meeting has been that they have not been essentially papers applying to land surveying. I must admit it is so long since I engaged in the practice of survey and the type of practice that I did carry on, did not make it necessary for me to follow a great many of these formulae that were received in our lectures at the school. I know Professor Stewart has given a great amount of study to work that applies directly to our practice, and I think when we have time to study out the workings of the formulae he has presented many of you will find a great deal of value in the work he has done. It is in order for a motion regarding the paper.

Mr. Aylsworth—I would like to ask Mr. Stewart how the results of these formulae would compare with the tables as supplied by the Dominion Land Surveyor's Office at Ottawa. By using a sidereal watch and taking sidereal time from the standard time, and checking it up by observation on the time chart, how would the result compare with your formulae?

Professor Stewart—I have not used the D. L. S. table; they are correct as shown by working out and agree with the formulae.

Mr. McGeorge—I would like to move the thanks of the Association to Professor Stewart and move that the paper be printed as read.

Mr. Dobie—I take great pleasure in seconding that motion. Carried.

The Chairman—Mr. Pierce, would you give us your paper?

Mr. Pierce—I move the adoption of the report.

Mr. McRostie—I take much pleasure in moving a vote of thanks to Mr. Pierce, and I also add that it be published in the Annual Report.

Mr. McKay—I have great pleasure in seconding the motion. Mr. Pierce referred to the use of the radio in his paper. I had rather an interesting experience yesterday morning, about 4 o'clock, listening in on Chicago broadcasting to Dr. McMillan, who is exploring in the regions of the North Pole.

The Chairman—I think we have reached the time for adjournment. We have kept pretty closely to the program, both yesterday and today.

Adjourned until 2 p.m.

2 P.M. SESSION.

Wednesday, February 20th, 1924.

Mr. McGeorge—(Chairman).

The Chairman—If you will come to order we will go on with the afternoon's program. The first matter is the Report of the Committee on Drainage.

Mr. Newman—There is a matter I would just like to have left in the hands of the Drainage Committee to discuss before the formal report is printed in the Minutes, if that is agreeable to the meeting.

The Secretary—Subject to the inclusion of the Committee's discussion of Mr. Gray's problem I move the adoption of the report.

Moved by the Secretary, and seconded by Mr. McRostie, that the report be adopted, with the provision that the one problem be taken up with Mr. Gray and included in the report. Carried.

The Chairman—The next order of business is a paper on Drainage, some comments on the Municipal Drainage Act, by Mr. Scott.

Mr. Scott—It may be as well in reading this paper if I omit the names of the cases from which I quote, so as to preserve the continuity of the report. (Reads paper).

The Chairman—Gentlemen, Mr. Scott's paper brings out very clearly many of the underlying principles of the Drainage Act. I think it is worthy of comment and worthy of discussion. Mr. Scott must have given a good deal of time and work preparing that paper, because there are some very difficult matters dealt with. The paper is now open for discussion.

Mr. Newman—Mr. Chairman, I personally feel very grateful to Mr. Scott for preparing that paper. It is a pretty hard proposition to get something for the drainage report, and Mr. Scott came to the rescue and he certainly did it in a creditable and efficient way. I have very much pleasure in moving that Mr. Scott's report be received and published in the Minutes.

Mr. Henderson—Before the motion is put, may I take the liberty of complimenting Mr. Scott on the paper. It is a very excellent outline of the broad principles of the Act, and I certainly trust all interested in drainage will give it careful study.

Mr. Lee—I want to second that report and add one word of tribute to the very excellent paper.

The Chairman—If there is no further question we will put the motion. I think that nothing has been said has exaggerated the feelings of the Association in regard to the paper. What is your pleasure in reference to the motion? Carried.

The Chairman—The next item of business is the Report of the Committee on Legislation—Mr. leMay.

The Secretary—Mr. Chairman and Gentlemen: I must apologize for this report being short. It is due to the fact that the Legislation Committee was not able to get together until noon today. (Reads report).

The Chairman—Now this morning we will take up the next item, the report of the Committee on Town Planning.

H. L. Seymour—Mr. Chairman and Gentlemen: Before I proceed to the reading of this report, which is not very lengthy, I want to take the opportunity to tell a story. I do not think Mr. Aylsworth is here, but I have noticed at all these annual meetings at which I have had the pleasure to attend, Mr. Aylsworth has the opportunity of telling us some very interesting stories, and I feel if I want to be in his class I want to take the opportunity now while I am on my feet. Mr. Aylsworth comes from Madoc. As a youngster that was my home, and I know him personally and by reputation. I do not want to lead you to any anticipation of a story of the exact character that Mr. Aylsworth generally tells. You may be disappointed.

When I was down at the annual meeting of the Engineering Institute of Canada recently, I did hear a new story, and I thought I would pass it along, and this was the story; that a gentleman a little worse for wear wandered into his club and saw a stuffed fish on the side of the wall, a very long fellow. He looked at it and thought a while and said, "Well, the man that caught that fish is a liar." The Secretary says it is like Mr. Aylsworth's stories, it is old. (Reads report).

I hope to have the pleasure of discussing Mr. McKay's paper later on. I would personally like to urge your interest in Town Planning, as I firmly believe it is very important matter. I would be glad to move the adoption of the report.

Mr. McRostie—I second it.

Mr. Reuben—One point I would like to impress on surveyors here, who are likely situated in some parts of the Province where there is not likely to be any other surveyor for some miles around, is that any such who is not a member of the Town Planning Institute should become so. It is a very important feature for them in their district. If for no other reason than that when found out by the people in his community it will start them talking as to what town planning really means. It is not going to cost them very much, and I don't think the examination or thesis is very hard. To become a member of the Institute one must be an Ontario Land Surveyor to be entitled to full membership. I think it would be a good time for members, especially those situated in smaller cities or towns, or some place like that, to become members of the Town Planning Institute, and when

they become members they can have printed on their letter-heads the fact that they are members, and in that way bring forward to the notice of the people there is such a thing as a Town Planning Institute. It would eventually do the surveyor some good.

The Chairman—It has been moved by Mr. Seymour, and seconded by Mr. McRostie that the report be adopted. Carried.

The Chairman—I do not want to shut off the discussion. I think the town planners are to be congratulated on the interest they have awakened this afternoon. What is the pleasure of this meeting in regard to the paper of Mr. McKay.

Moved by Mr. Seymour, and seconded by Mr. Bolton, that the paper be adopted and printed. Carried.

The Chairman—The next report is the report on Biography, but I understand that is not ready. We might take up next the report of the Committee on Repositories, by Mr. H. L. Esten.

Mr. Esten—(Reads report). I would move the adoption of this report.

Mr. Rorke—I have pleasure in seconding the motion, and in seconding, as the committee asks for an expression of opinion as regards some of these books, I would like to point out what there are here. There are a lot of reports that are not bound. If anybody is looking for one of these reports, it is doubtful if they would come to this library to find them. They would go to some reference library. I went through bookcases the other day and picked out some old material which is unbound and the pages loose, and it is a question whether they could be bound.

Mr. Wilkie—In reference to some of the old books, I do not know whether they are worth binding—they have been presented to the Society. They might be picked up by somebody as a piece of antique furniture. As to the value of them after being bound—I do not think they should be bound, as any person would go to the public library for information.

The Chairman—First I think we better deal with the motion to adopt the report, and take up the question of the books mentioned.

Mr. Esten—We thought it would be better to let the members know if they wanted any copies of the reports they will be available. I have included in my report the numbers of the various reports that are on hand in the Parliament Buildings.

The Chairman—Now, gentlemen, you have heard the report. We will deal first with the motion in reference to the adoption of the report.

Moved by Mr. Esten, seconded by Mr. Rorke, that the report of the Committee be adopted. Carried.

The Chairman—Do you want to take some action in regard to these books. I presume a motion would be in order by some member to bring the matter to a head.

Mr. Gibson—Some of these volumes ought to be bound and others that can be found in other libraries might be disposed of. There may be members of the Association who are keeping up a library of their own and possibly they could be disposed of by auction to members of the Association.

The Secretary—In that connection I would like to state that the Library Committee of the Engineers' Club had a proposition of this kind to deal with, and they disposed of approximately one and one-half tons, and the best bid they got was twenty-five cents.

Mr. Nash—Might I move, Mr. President, that the disposal of the books be left to the discretion of the committee, and those that would normally be found elsewhere be destroyed, or as they think best—leave it entirely to the committee.

Mr. Jackson—I second that. Carried.

Adjourned until 10 a.m., February 21st, 1924.

10.00 A.M. SESSION,

Thursday, February 21st, 1924.

The Chairman—There is one item of yesterday's program that was not taken up when we adjourned, and Mr. Chipman is here and we will have his report of the Committee on Biography.

Mr. Chipman—(Reads report).

The committee realizes that publishing this report with the portraits takes up considerable space and is of consider-

able expense to the Association, so I will just mention it again that any time you consider the expense unwarranted, just say so and the Committee will cease operations.

We cannot promise you anything for next year; there are a few under way which could be completed, but it involves more work than any of you have any conception of. I would like to see sketches of some of those older pioneers of record before I am relieved of office, but we must depend primarily on the surveyors and younger men who are working in the older sections of the country. You don't know what day you might stumble over some trace of some surveyor who did good work in the past or you may meet a fellow surveyor who could give you information that is necessary for a sketch. Before I close I wish to add that the Veterans' Luncheon will be held at 1.30, and Mr. Henry Smith, now in his 87th year, will preside at the meeting.

I will move the adoption of the report and that it be printed in the proceedings.

Mr. Aylsworth—Before seconding the motion for the adoption of this biography report, I think Mr. Chipman, as usual, deserves a great deal of credit, and how he accomplishes the work he does and manages to collect the data by all sorts of methods, subterranean, underhand and methods that he adopts, I don't know. I have assisted him with two or three biographies, and it took me a year to get one at the same time he is getting twenty-five. He is a young man yet and he is getting the old surveyors pretty well lined up. He suggests the expense might be a reason for curtailing this report, but it is my opinion he should go on with the job and get biographies of the older men at least, and if they feel the expense is excessive, we might take a rest.

I am not in favor of curtailing this work until Mr. Chipman has finished his biographies of those gentlemen mentioned in his report. Mr. Chipman and I know of histories of men whose biographies should appear in the records, and I do not think this should be curtailed until he completes his work along these lines. I therefore second the adoption of his report. Carried.

Mr. Chipman—I desire to thank the Association for this vote, and I might mention that we have here in the club rooms an instrument which may have come from King Tut's

tomb, but we have found no surveyor who can tell us what it is used for. I will bring it in and exhibit it, and you can pass it around while the ordinary business is going on.

The Chairman—Would you bring it in and describe it before it is passed around?

The Secretary—Where did it come from.

Mr. Chipman—I can't say. An ancestor of Hugh Grayley, I believe, used it.

Mr. Rorke—I would like to add my tribute to the work Mr. Chipman is doing. I do not know that anybody outside of the Secretary could appreciate the work Mr. Chipman is carrying on. He is gradually getting our ancestors cleaned up.

Mr. Chipman—The President may be able to tell us without much delay what this instrument is. We referred it to Mr. L. B. Stewart, the Provincial Astronomer, but he desired time to consider it and look it over.

The Chairman—Deviating slightly from the printed program and dealing with the question of unfinished business, is there anything to be taken up?

Under the head of New Business there are a number of resolutions and there may be some other new matters.

The Secretary—There is a report on Re-Surveys by Mr. Chipman.

Mr. Chipman—At the meeting of 1922 I made a suggestion that a committee be appointed on Re-Surveys, which was done. The Association at the meeting made this mistake, they appointed me as Chairman, that was the mistake made. Possibly it was a penalty being imposed for bringing in such a suggestion. Our Committee met after some considerable correspondence in February, 1923, and we brought in an interim report which is recorded in the minutes and has been published. We met again on the first day of May here. I must confess, as Chairman of the Committee, that I was somewhat remiss in my duties, as I should have studied the Survey and Registry Act before convening a committee on Tuesday morning. (Reads report).

I am quite sure the members of this committee will be quite willing to co-operate or assist the Legislative Commit-

tee, as this is a matter for the Legislative Committee to take up. No doubt they can agree on that. They would not be bound by the wording of that resolution.

I move, Mr. Chairman, that the report be received, adopted and printed in the proceedings, and that the committee be dissolved.

Mr. McCubbin—I second the motion. Carried.

The Chairman—We will now have the report of the Entertainment Committee, Mr. vanNostrand.

Mr. vanNostrand—The Entertainment Committee has not been able to get out a report. They have not received the bills in connection with the different activities yet. I would suggest when the report is ready we forward it to the Secretary, and he print it in the proceedings in the usual way.

Mr. Ward—Seconded. Carried.

Mr. Pierce—Mr. President and Gentlemen: I have a question which I wish to bring up; I do not know whether it is the proper time, but it has been on my mind for some time back, and that is the possibility or desirability of increasing our publications so that we would have some medium of publication that would be of more general interest to surveyors throughout Canada than what our annual report is today.

We have in Canada several distinct organizations of land surveyors extending across the continent; each of those organizations is today publishing an annual report which is very valuable insofar as it goes. These organizations are distinct and separate. When you look at some other organizations, such as the medical, or take the Engineering Institute—that organization is one of our most powerful organizations today. In referring to this organization I do so because it is a united organization, and it is publishing periodicals that reach its membership in all parts of Canada. Now an experiment has been made by the Dominion Land Surveyors' Association in attempting to publish a periodical four times a year, quarterly. It has been carried on by that Association themselves for two years, and has met with success, and it is receiving the appreciation of the Dominion Land Surveyors who are receiving the publication.

It has occurred to me possibly something along that line would be of more value if it could work out so it would reach

all surveyors in Canada, and not be confined to one particular Association. This is more or less of a suggestion. Before I left Ottawa I had been thinking of this question and took it up with the Dominion Land Surveyors, who are responsible for their publication as to what their attitude would be. So far as I can make out from them I was given to understand that there would be no objection on their part to issuing a publication like theirs, or similar to that.

I find there are cases where Ontario Land Surveyors have been approached by the editors of the D. L. S. publication to contribute to its publication. They are acting as Ontario Land Surveyors, and the material, if they decide to contribute, will probably be of more interest to the Ontario Land Surveyors than to the Dominion Land Surveyors.

It seems to me some scheme along these lines would have great possibilities for the development of conditions of surveyors throughout the whole Dominion.

Now the cost of the publication, so far as I was able to ascertain, to the Dominion Land Surveyors, has been in the neighborhood of \$235.00 for four issues. I think they get four hundred copies of each at just about the maximum for a hundred. You can economically purchase from a publisher additional numbers, and the additional cost, I believe, would be about \$3.00 a hundred copies. If the total membership of the various Associations were to go into this thing—I am speaking offhand—it might mean that the publication would amount to a thousand copies, while the additional cost would be negligible if taken pro rata by the Associations concerned. The way it would have to be worked out, if it was considered advisable, would be that each Association would have to undertake to supply a certain amount of matter per issue or per year, and see that that material is forwarded to the central publication committee, wherever that might be.

This is only a suggestion of my own, and I did not know how it would be received here. I may say that it is not original, because it has already been put in force in other districts. As I was leaving Ottawa, one of the boys with whom I had been talking, presented me with Volume No. 1 of a publication that had just been received there from the South African Surveyors. It is a joint publication by the Surveyors of Cape of Good Hope, the Transvaal and Orange Free

State. The first is a highly creditable number and it may be better ones will follow, but it certainly shows that other Surveyors' Associations realize the necessity or importance of just what I am leading up to here. I hope some of you gentlemen will discuss this if it has any merits.

The Chairman—Mr. Pierce has raised a very interesting point, as he usually does. It looks to me if this Association decided to go into that you would soon require a new committee, a committee on publicity.

Mr. Aylsworth—I think that is a good idea; it is a new one—it is the newest. There was a proposition started here a couple of years ago for an amalgamation of all Surveyors' Associations by Provinces, but that in some way fell through, but now here is a proposition brought up that seems to bring the old proposition up again in a new way, and would be a booster for it. Now we have always felt, and we still feel, that it is a burning question in the Association to get stuff over and get it to the public, and if we had a publication like this and all Associations did join in and contribute towards the upkeep and publication, I think we would have a medium by which we could get our information over to the public, and when a crisis arose in our affairs and we wanted all hands to pull together, I think we would have an organization that would have some force. I think there seems to be some uneasiness here and the hour is getting late. It is a pretty large subject to take up, and I would suggest this thing be studied out and a committee be appointed, if possible. I think it would be well to have this investigated, and I would suggest a committee.

Mr. Chipman—Why not submit it to the incoming council?

Mr. Aylsworth—That is a good idea.

Mr. vanNostrand—Mr. President, I am quite in accord with what has been said about this publication. I have seen numbers of it, and have been very much interested, and as a newly initiated member of the Dominion Land Surveyors I see there are quite a number of our own members who will not get it in that way, and it seems to be an opportunity for them. The idea of Provincial Associations joining in the subject matter of a publication of the kind is a rational, reasonable one, and I think in addition to leaving it to the incoming Council, a motion from this meeting, asking them to take it

up with the Association of Dominion Land Surveyors, with a view to co-operating with them in the publication within certain limits, would be a proper form of request to put to the incoming committee.

I therefore move the matter be left with the incoming Council and they be requested to take the matter up with the Dominion Land Surveyors' Association, with that object in view.

Mr. Bartley—I would like to second the motion, and in doing so I would like to endorse what Mr. Pierce has said, to the extent of saying my experience in connection with this publication has been that I have found it to be very valuable. I was formerly engaged in one of the branches where a large part of the material for this journal is prepared, and several other Dominion Land Surveyors were in the branch, and we found it most valuable in keeping in touch with the work of Surveyors in general. That is one of the dangers we foresaw at one time that we were not going to be able to keep up to date, and we found through it we accomplished a lot. I might also say I went again during the past year to one of the members and had occasion to discuss surveys with him; he is a fairly prominent man in this province, and had very old ideas regarding surveys. I happened to have a copy of the paper with me referring to surveys, and some of the modern developments, and I was able to show him that we have kept up to date, to modern times, and I incidentally surprised him a good deal. Not only, I think, as Mr. Pierce has said, has the profession been failing in not having a weekly or monthly publication, but take other trades and occupations, they are doing it—the hardware merchant, the grocers and bakers and ordinary trades, in order to keep in touch with the markets and the progress of their work, are using these publications as a medium, and I do not think Ontario Land Surveyors can afford to lag behind. I have much pleasure in seconding the motion. Carried.

Mr. McCubbin—Mr. Chairman, I move the thanks of the Association be tendered to the Engineers' Club for the hospitality we have enjoyed here, and the courtesy that has been extended to us for a great many years. We have appreciated it this year perhaps more than before. And I also move that the vote of thanks of the Association be extended to the man-

agement of the Prince George Hotel, for the courtesy extended the ladies.

Mr. Newman—Seconded. Carried.

Mr. Pierce—While we are on the subject I would like, on behalf of the visiting ladies who have come here, to extend to the ladies of Toronto and to the Committee of the Association, their appreciation of the hospitable manner, and highly successful method of entertainment that has been given them while they have been in the city. It has been very helpful to them on this occasion of their visit to Toronto, and I hope the ladies of Toronto and the Entertainment Committee will understand their appreciation is most sincere.

Mr. McCubbin—The same thing has been bothering more than one member from out of town, apparently, and as to just what we could do—whether we could do anything in the way of a motion. All of us from out of the city appreciate very much the courtesy extended to the ladies, and we appreciate the kindness of the Toronto members, and it is a very great obligation they have put us under, and we do not know just what action we can take in the Association. We want them to feel that is the feeling of every member from outside of Toronto. There is no way in which we can slap back. I think all I can say personally is that any member of the Association who is passing through Chatham on business or with his wife and family will be welcomed as a personal friend at my office or at my house at any time, and I am sure every member will say the same thing. I will take the risk of putting a motion that the thanks of the out of town members be tendered to the Toronto members and the Entertainment Committee for the hospitality they have shown us, and their wives.

Mr. McGeorge—I would like to second that motion. It seems to me the outside members receive so many courtesies it is impossible for us to express our appreciation. Personally I can heartily endorse what Mr. McCubbin says. We would like to be able some time to repay the Toronto members for their kindness. I have much pleasure in seconding the motion.

Mr. Routly—With the consent of the mover and seconder I would suggest it include the committee of ladies in Toronto who arranged many of the details.

Mr. McCubbin—It was surely intended to.

Mr. Aylsworth—They seem to be covering my resolution. On account of this touch charming to our proceedings this year, I am not going to allow this opportunity to escape. Mr. Chairman, you should be very gratified at the results of this session, and as I said before, the touch charming that has been put to our proceedings this year. I do not know whether you are responsible or not for the innovation, but you should get credit for it coming under your Presidentship, and it has been one of the most charming touches we have been touched with since our Association was formed. Although my wife unexpectedly through circumstances, was unable to be here, I have no doubt I better say what I am going to say here, because I am not going to say anything at home. I am sure we did not expect this from you in addition to our program this year. We always expect a ladies' man to do this work, but to think that a wild and woolly west contractor would put this touch to our proceedings caps the climax. There are a great many ladies who have taken part in this little touch, and they are almost too numerous to mention: Mrs. Routly, Mrs. leMay, Mrs. vanNostrand, Mrs. Rorke, Mrs. Hogarth, and Mrs. Manson, have been indefatigable in their efforts to entertain and do things, and I think we all know that those who take the most prominent part and do the real work, and it is real work to carry through a program, get very little thanks except through the Association from the people who appreciate it. I have very great pleasure in supporting the resolution. I know from the success of it this year, it will be carried on next year, and I will try and have my wife here, and if she is here I will not be here. Carried.

Mr. McGeorge—I would like to extend to the Toronto members the thanks of the outside members, adding to the Toronto members, the Entertainment Committee and the Ladies' Committee.

The Chairman—I am sure on behalf of the Toronto members and the Entertainment Committee and the Ladies' Subcommittee, we all very much appreciate the feelings expressed by the out-of-town members, and we are very, very glad that the arrangements made have met with your approval, and I think it will be an encouragement to the Entertainment Committee to proceed along these lines another year.

Mr. Aylsworth—Mr. President, I have a resolution here—I don't know whether I will get a seconder for it or not. I

would move that the thanks of the Association be tendered to the committee who printed the magnificent manual which has just been issued. It is somewhat unique in modern history, and the work has certainly involved a great deal of work and ability to prepare it, and as the hour is getting on I will not take up any time. I would move a resolution of appreciation of the work that has been done and the valuable acquisition to our library. I move the thanks of the Association to the Chairman and the members of the Committee who prepared it.

Mr. Pierce—I have very great pleasure in seconding the motion. This work is probably the most useful publication that the Ontario Land Surveyors have produced. In the old days we had a manual which was a matter of uncertainty and vagueness, particularly to the younger members, and this publication covers everything of that nature. There is only one observation I have to make in connection with the mover's remarks. He refers to the importance of the publication and the place it would find in his library. I think the library is not where the publication should go, but as a matter of fact it should go on the top of your desk, or on the right hand side where you can refer to it. I have much pleasure in seconding the motion.

Mr. Aylsworth—I might say also that the Dominion Land Surveyors' manual is a very handy little book. When I went on Dominion Land Surveys I used to carry it around in my pack. I read aloud to myself from that book and kept it with me all the time, and got my various little conundrums settled in that way.

Motion carried.

The Secretary—Mr. Chairman and Gentlemen: On behalf of the Committee that prepared this manual I want to thank you very much for the expression of appreciation, and I trust the manual will serve the purpose for which it was intended. The effect that it has had is that the examiners found it quite impossible to pluck any of the candidates in the Surveys Act examination this year.

Mr. Rorke—In connection with the manual, in all publications which are not being revised and revised, there are little clerical errors which are liable to crop up. If any of the members find any of these we would be glad if he would

notify the Secretary, and we could get a supplement which could be pasted in, thereby correcting any of these little errors.

Mr. Pierce—Mr. President, I would move that the auditors be paid the sum of \$10.00 each for their services in connection with the operations last year.

Mr. Empey—I second that. Carried.

Mr. vanNostrand—I would move the sum of \$400.00 be granted by the Association to the Secretary or Secretaries attending to the duties last year. That is not a salary in advance, it is an honorarium that usually comes in at the end of the year's work, and as this year the work has been divided you will have to leave it to the two gentlemen concerned to divide the grant if it is passed in the usual way, and if they find any difficulty I would suggest they select an arbitrator.

Mr. Dobie—I take great pleasure in seconding that motion. I think that this Association has been well served in its secretarial work in the past. Speaking as a member of the Executive Council of this Association, it is a matter of extreme regret that Mr. Rorke has severed his connection with that department. A great deal of the success of the Association is owing to the manner in which Mr. Rorke has carried out the duties as Secretary. When we had to look around for a Secretary, a successor to Mr. Rorke, the task seemed rather difficult, but I think we have solved the difficulty in a manner that is most satisfactory to the Association. While the Association feels that Mr. Rorke's handling of the office in the past deserves the Association's thanks, we are very thankful for the Secretary we have. I take great pleasure in seconding that motion. Carried.

The Chairman—I feel what has been said regarding the efficient service regarding the office of Secretary is due him, and I also have great faith and hope the new Secretary will perform his duties in an equally satisfactory manner.

Gentlemen, we have come to the last item, unless some member has some new business—the election of officers for the new year. Do you wish to have nominations in open meeting, or would you prefer a Nominating Committee appointed.

Mr. Ward—I move we have an intermission so we can talk the matter over—an intermission for five minutes, as usual.

Mr. Rorke—You mentioned in your address that it would be advisable to suggest a letter of condolence to members of the families of deceased surveyors. I was wondering if that would require a motion, or would it be done without a motion? If the motion is required I would have great pleasure in doing it. I move a letter of condolence be forward to the families of deceased surveyors.

Mr. McRostie—I second that. Carried.

The Chairman—The officers to be chosen for the new year are, President, Vice-President, Secretary-Treasurer, two Auditors, and two members of the Council. I declare an intermission of five minutes to give you a chance to discuss these matters, and we will resume in five minutes.

Adjourned for five minutes.

The Chairman—I understand you are ready now to proceed with the nominations for President.

Mr. Dobie—Mr. President, it gives me great pleasure in nominating for President a man whom I think has served the Association for a great many years—Mr. W. G. McGeorge.

Mr. Aylsworth—I have very great pleasure in seconding that nomination. Carried.

The Chairman—I have much pleasure in congratulating you on the nomination.

Mr. McGeorge—Gentlemen, I can only say I really appreciate this honor very much; I do not think there is any honor which can be conferred greater than that of President of such an Association as that of the Ontario Land Surveyors, and I can only express the hope I may be worthy of that honor.

The Chairman—Nominations for Vice-President.

Mr. Dobie—I want to bring before you the nomination of Mr. L. V. Rorke for Vice-President. I am not going to make any speech to extol his merits. You know his service to the Association, and I feel quite sure if he is elected as Vice-President he will go on better than he has in the past.

Mr. McCubbin—I have much pleasure in seconding the nomination. Mr. Rorke has done eminent work for the Association; he has practically made the Association in the last few years and he has drawn a ridiculously low salary,

and it is a pleasure to put him to work again at a salary reduced, but the Association will be honored.

Mr. Pierce—I move that the nominations be closed.

Mr. McCubbin—I second the motion that the nominations be closed forthwith.

Mr. Aylsworth—I agree, close it right off, forthwith. Anyway we always had to go to Mr. Rorke for our copies of field notes, and it has got to be second nature to go to Mr. Rorke to assist the Association out of difficulties. We have to have him some place, and I think the best place to have him is Vice-President for this year. Carried.

The Chairman—I must congratulate you on the unanimous choice of this Association.

Mr. Rorke—I thank you gentlemen.

The Chairman—I call for nominations for the office of Secretary-Treasurer.

Mr. Rorke—Mr. Chairman, it affords me a great deal of pleasure to nominate for the office of Secretary-Treasurer Mr. leMay. When I found it necessary to give up the position, owing to different circumstances, I felt sure the Council would appoint somebody who would carry on, and carry on well, and so here we have been able to see the results. I have great pleasure in nominating the Secretary-Treasurer. I want, as past Secretary, to thank you for the kind words that have been said about the Secretary and hard work. I assure you it is very gratifying to me. I can only ask for a continuance of your assistance to the new Secretary.

Mr. Empey—I have much pleasure in seconding that motion.

Mr. Muckleston—I move the nominations close.

Mr. Aylsworth—I second the motion. Carried.

The Secretary—I thank you very much, gentlemen, and assure you I will do everything I can to make this Association a better and stronger Association. All I can do is hope that I can live up to the record Mr. Rorke has set.

Mr. Aylsworth—Before the remarks close on this subject I have one suggestion to make. Every year we have some unique machine or instrument come here, such as Mr. Chipman has produced. Now I would suggest for our next meet-

ing that we have a home brew machine here, and I am not offering any suggestions whatever, but I was wondering if the Secretary could handle that Department.

The Secretary—Would you suggest a medical officer in attendance?

Mr. Bartlett—I think that would require a committee whose labors would begin much earlier than the convention.

The Chairman—We have to nominate the men for the office of Auditors—two Auditors. Mr. James and Mr. vanNostrand were Auditors last year.

Mr. Muckleston—I would nominate Mr. James and Mr. vanNostrand for Auditors.

Mr. Dobie—I second the motion. Carried.

The Chairman—There are two officers to be appointed as members of the Council. The Council of the Association is really the heart of the Association, and it is in the choice of men for this position that we need to take the very greatest care. We will call for nominations for two who are required to take the place of Mr. Speight and Mr. Dobie; both these gentlemen being eligible for election.

Mr. McGeorge—It gives me pleasure in nominating Mr. T. B. Speight. I think there is nobody who could be more missed than Mr. Speight. He is unavoidably absent this year, and I think he was unavoidably absent last year. I feel it has been a great loss that Mr. Speight has been unable to be here. I have much pleasure in nominating Mr. Speight.

Mr. Bartlett—I have much pleasure in nominating Mr. E. W. Neelands.

Mr. McCubbin—I would like to nominate Mr. J. S. Dobie, his services are so well known there is no need to enlarge.

Mr. Wilkie—I have much pleasure in nominating Mr. Newman.

Mr. Rorke—I have much pleasure in nominating Mr. S. V. Code.

Mr. Wilson—I nominate Mr. Ardagh.

Mr. Muckleston—I nominate Mr. Roger Lee.

Mr. Pierce—I beg to nominate Mr. McRostie.

Mr. Muckleston—I move the nominations close.

Mr. vanNostrand—Seconded. Carried.

The Chairman—As the number of nominees is more than the number required, it will be necessary that a ballot be forwarded to each member for voting, and I would nominate Mr. Esten and Mr. Ward, who served as scrutineers last year, again act in this capacity.

The Secretary—In order that the final part of the proceedings may be carried out I make a suggestion that the President vacate the chair, and the President-elect take his place.

Mr. McGeorge—Chairman.

Mr. Dobie—Mr. Chairman, I take upon myself the honor of moving a vote of thanks to the retiring President for his untiring efforts to make this meeting a success. I am sure that motion is going to be one that is going to receive a lot of support. I know from experience just what the President has to do; I went through it once myself a few years ago. It seems to me along about that time the Ontario Land Surveyors Association was just pulling along. Every year since it has been growing and getting bigger and the interest of the outside members has increased largely due to the manner in which we are looked after by the Toronto members and all those who have to work, from the President down. This year has been an exceptional year; I don't think in the history of the Association we have ever had as successful a meeting, taking it from all possible standpoints, as we have had this year. With the assistance that the Entertainment committee has given, the outside members have had a reception that we will always remember and I think I am speaking for every man from out of town when I propose a vote of thanks to Mr. Routly for his untiring efforts during the past year in furthering the interests of this Association.

Mr. Empey—I have very great pleasure in seconding the motion. Carried.

The Chairman—Before putting the motion, I would like to add my own word of thanks to Mr. Routly for the many courtesies extended; I think he is surely entitled to the thanks of the Association. I have much pleasure in putting the motion that a vote of thanks be tendered Mr. Routly. Applause.

Mr. Routly—Mr. President and Gentlemen: I appreciate this vote of thanks very much. I have always been anxious

to do my little towards the development of this Association and if I have been able in the past to do anything that met with your approval I am very grateful. The success of the annual meeting is not due to my efforts, only in a very small degree, but due to the Entertainment Committee and those who have prepared papers. I feel the spirit of interest is more alive in the Association than ever before, if that is possible, and one word I would say in parting, is make every effort to keep your membership up. Men who have not been here for years turned up at this meeting, and I think we will see more of them in the future. If we can get out to the meetings you can depend upon it they will be interested in the affairs of the Association, and will thus make the Association of value to the whole profession.

Upon motion the meeting adjourned.

REPORTS

SECRETARY-TREASURER'S REPORT

The statement of Receipts and Expenditures for the past year is presented for your consideration. It will be noticed that the Expenditures are considerably in excess of the revenue. This is attributable to the cost of printing the Manual and the purchase of three shares of Consumers' Gas Company stock.

The changes in the register comprise six new registrations, two retired and four deaths.

Financial Statement for the Year Ending January 31st, 1924.

REVENUE

Annual Membership Fees	\$1,642.00
Dividends, Consumers' Gas Co. Stock	111.12
Sale of Fractional Share, Con. Gas Co. Stock	6.55
Receipts from Board of Examiners	954.00
Sale of Manual	297.50
Miscellaneous Receipts	6.00
Interest on Savings Bank Account	16.72
	<hr/>
	\$3,033.89
Expenditure over Revenue	551.51
	<hr/>
	\$3,585.40

EXPENDITURE

Auditors' Fees	\$ 20.00
Stenographer's Report of Annual Meeting	51.00
Publication of Annual Report	872.11
Premium on Secretary-Treasurer's Bond	5.00
Expenses of Members of Council	50.65

Grant to Secretary-Treasurer	400.00
Three Shares and Fraction Con. Gas Co. Stock	405.00
Printing and Stationery	139.79
Publication of Manual	846.90
Postage	115.00
Expenses re Manual	24.00
Miscellaneous Expenses	12.72
	<hr/>
	\$2,942.25
Board of Examiners' Expenses	643.15
	<hr/>
	\$3,585.40

SUMMARY

Bank Balance and Cash, February 1st, 1923	\$1,823.14
Expenditure over Revenue	551.51
	<hr/>
	\$1,271.63
Balance in Savings Acct., Feb. 1st, 1924 ..\$	570.55
Balance in Current Acct., Feb. 1st, 1924 ..	653.20
Cash in Hand	47.88
	<hr/>
	\$1,271.63

ASSETS

Stock of Manuals on hand	\$ 549.48
Cash in Bank and on hand	1,271.63
13 Shares Con. Gas Co. Stock at \$166	2,158.00
Office Furniture	100.00
Arrears of Fees Collectable	250.00
	<hr/>
	\$4,329.11

AUDITORS' REPORT

We hereby certify that we have examined the Secretary-Treasurer's Books, Bank Accounts, vouchers and financial statements herewith and find them to be correct.

Dated at Toronto, Feb. 18th, 1924.

JOHN vanNOSTRAND,
D. D. JAMES, Auditors.

REPORT OF THE COUNCIL OF MANAGEMENT

The Council of Management held two meetings during the year.

At the regular meeting held on April 17th, the following business was transacted:

The report of the Special Committee on Registered Plans was received and recommended as follows:

1. That all plans on file in the Registry Offices be copied in order that the further handling and mutilation of originals be avoided, and also to facilitate the furnishing of copies of plans to persons desiring the same at a reasonable cost.

2. That in future plans be filed in triplicate, one unmounted tracing to be retained by the registrar for blue-printing as well as the mounted copy for filing.

A copy of this report was forwarded to Mr. W. D. Gregory, Chairman of the Public Service Commission.

Mr. S. W. Pierce was appointed to fill the vacancy on Council caused by the election of Mr. McGeorge as Vice-President.

Mr. Speight's resignation from the Board of Examiners was received and regretfully accepted, Mr. John vanNostrand being appointed for the unexpired part of Mr. Speight's term.

Mr. Rorke's resignation as Secretary-Treasurer was received, and regretfully accepted. Mr. T. D. leMay was subsequently appointed in his place.

At the meeting held on Tuesday, February 19th, the report of the Special Committee on preservation of Registry office plans was discussed, the Secretary reporting that it had not been possible to secure action at the last meeting of the Legislature. The Secretary was instructed to bring the matter to the notice of the Attorney-General.

The appointment of Mr. T. D. leMay as Secretary-Treasurer was confirmed.

The Secretary was authorized to take the necessary steps to secure the copies of all the Survey Acts and amendments since the year 1800 for analysis in order that changes in system may be noted. The Council decided this important in

view of the fact that no Survey Act is retroactive and that old surveys cannot be properly considered unless the statute under which they were performed is available for reference.

SUPPLEMENTAL REPORT

The Veterans' Luncheon on the afternoon of Thursday, February 21st, was attended by the following:—

V. B. Wadsworth, April 9th, 1864, Chairman.

John D. Evans, July 8th, 1864.

Hugh D. Lumsden, Jan. 4th, 1866.

*Elihu Stewart	1872	*A. J. vanNostrand . . .	1882
A. P. Walker	1882	H. K. Wicksteed	1886
Allan R. Davis	1886	*C. F. Aylsworth	1886
L. V. Rorke	1890	H. L. Esten	1887
W. E. Stewart	1892	*J. S. Dobie	1898
Charles E. Fitton	1879	*H. T. Routley	1907
*Willis Chipman	1881	*George Hogarth	1912
Geo. A. Mountain . . .	1884		

*Ex-Presidents of Association.

Letters were read from George Gibson, now the Senior Veteran; James Dickson, the oldest Surveyor in this Province, and others, who were unable to attend.

Mr. Henry Smith, who was expected to preside, was unfortunately prevented from coming by the heavy snowstorm that prevailed during the day.

Reminiscences were in order after the luncheon, which were enjoyed by all.

A resolution was adopted requesting the Association to publish the message of Dr. Otto Klotz to the Veterans in 1916, and the Chairman was requested to write the Senior Veterans prior to Confederation, the greetings of those present.

WILLIS CHIPMAN, Chairman.

REPORT OF BOARD OF EXAMINERS

The following Surveyors having fulfilled all the necessary requirements have during the past year received certificates to practice:—

C. R. Lyon.
W. C. Murdie.
C. H. Ney.
G. H. Richards.
F. T. Webster.
C. G. Griffin.

The following articles of apprenticeship have been registered during the year:—

Name	No. of Years	Surveyor
C. D. Wight	3 years	N. B. MacRostie
B. W. Paget	1 year	F. A. Gilbert
F. C. Weir	3 years	J. M. Blyth
W. A. Seawright	3 years	Speight & vanNostrand
G. D. Brown	3 years	E. Fitzgerald
W. F. Weaver	3 years	Speight & vanNostrand
J. H. Beatty	3 years	H. L. Esten
F. O. Eaker	2 years	John Lanning
J. C. Chaderton	3 years	Speight & vanNostrand
C. G. R. Armstrong	6 months	J. J. Newman
G. W. Smith	1 year	H. L. Seymour
D. I. Nattress	1 year	G. L. Ramsay
R. E. Richardson	3 years	L. D. N. Stewart

The regular examination of candidates commenced on Feb. 4th, 1924. The following candidates presented themselves for examination:—

Final Examination

J. N. Gregorieff, Toronto.
S. G. Smith, Toronto.
C. G. R. Armstrong, Windsor.
Ivan Flint, Toronto.
G. H. Ferguson, Toronto.
S. W. Archibald, Toronto.
M. T. Gray, Hamilton.
J. C. Monteith, Fort William.
A. B. Gibson, Toronto.

The Board met on the 18th February, 1924, and after summing up the several marks, it was found that the following had duly passed the examination:—

Final Examination

J. C. Monteith.
M. T. Gray.
Ivan Flint.

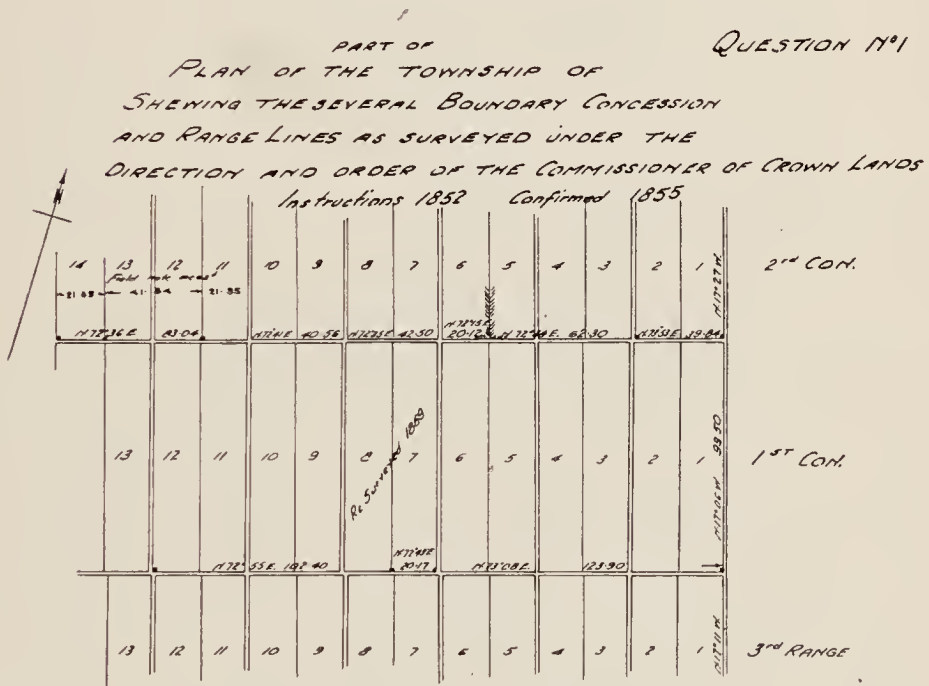
T. B. SPEIGHT,
Chairman of Board.

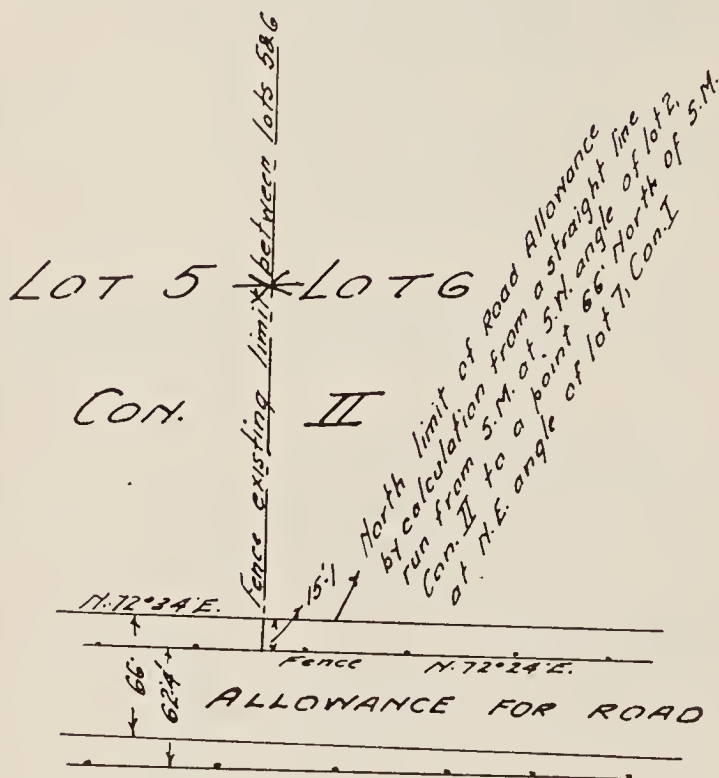
REPORT OF COMMITTEE ON LAND SURVEYING

R. M. Anderson, O.L.S., Chairman

The following questions were submitted to your Committee for consideration:

Question No. 1





САН. I

SKETCH SHEWING
EXISTING CONDITIONS
OF S.W. ANGLE OF LOT 5,
CON. II

The Report of the Survey of 1855 says in part: "In all cases where any portion of a line is stated in the field notes to be **on the original blazed line,**" without reference to evidence, the original blazes can still be traced or has been distinctly and satisfactorily traced and marked by myself, and when stated to be "on the undisputed line" as in part of the line in front of the 2nd Concession, the land having long been cleared, fences erected believed to be on the line, the road improved, and other improvements made, and never disputed, has been taken as prima facie evidence of the original line.

The field notes or part of the 2nd Con. are as follows:

Field Notes from the 2nd Concession

S	73	53	W	39.84 to a Stone M. planted on site of original post at S.W. Angle of Lot 2.
S	72	34	W	62.30 on the undisputed original line.
S	72	15	W	20.12 on the undisputed original line.
S	72	35	W	42.50 on the undisputed original line.
S	72	41	W	40.56 on the undisputed original line.
S	72	36	W	21.35 to a stone monument planted on the site of an ash tree, the original monument between lots 11 and 12. See evidence 22.

Stone monuments were established only at undisputed corners, although several courses of different bearings and length are shown between such monuments.

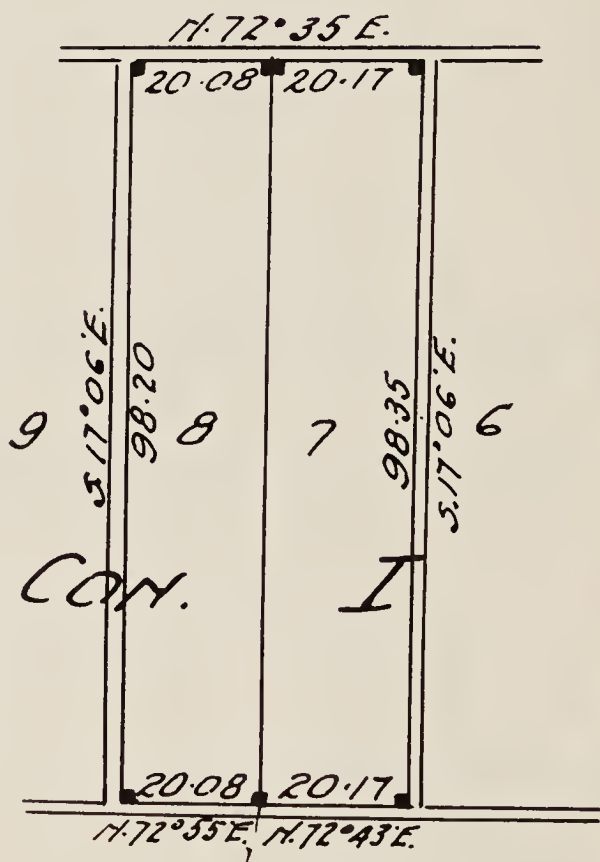
(a) How should S.W. angle of Lot 6, Con. 11 be established?

(b) Across lots 11 to 14 there is a difference of a chain between plan and field notes. Which governs?

PLAN OF LOTS 7 & 8
IN THE I CON.

Confirmed 30th July 1869.

CON. II



Answer 1—(a) Base survey on Municipal Survey of 1852, and re-establish traverse between stones at lots 2 and 12. Ignore the stones planted in survey of 1869 if they substantially disagree with the traverse of 1852, unless their position is corroborated by other evidence pointing to a mistake in the returns of 1852. (b) Use field notes. Error can probably be located in the field.

The Secretary—I would like to ask whether you would be guided by the monuments at the north angles of lot 7 in concession 1?

Mr. Anderson—I would rather follow the traverse between the stakes at lots 2 and 12 as shown on the survey.

Mr. Anderson—The feeling was there might be some slight inaccuracy, but if they were followed closely there might be sufficient evidence to complete the traverse, and you might exactly get the stakes at lots 7 and 8. If stakes came within a foot or so that would be plenty of evidence that they were planted on the line.

Mr. Rueben—You do not say how the stakes were planted.

Mr. Anderson—In a municipal survey.

Mr. Rueben—You never pay much attention to the rear. This is a case where connections were established in the first survey, and there was a later survey, and as it appears it would very likely cause an overlap of 15 feet.

Mr. Anderson—Apparently it was the other way around.

Mr. Rueben—Generally these stakes could not be considered to establish the south limit of the road between lots 7 and 8. I do not know that there is any confusion about that. You can establish the north side of the road and then come over to fix the south line. This is a case, however, where the south limit has been fixed and monuments placed in a municipal survey, and I would be inclined to accept them. It strikes me these points had been fixed, and there is no reason why they should be ignored.

Mr. Smith—I do not think the Committee should ignore these monuments that are established.

Mr. Anderson—The Committee did not ignore these stakes; undoubtedly they would govern these particular lots.

Mr. Aylsworth—When were the lines drawn?

Mr. Anderson—In 1852.

Mr. Aylsworth—When, in the first concession?

Mr. Anderson—It was re-surveyed in 1852 and confirmed in 1855, and the two lots originally in 1869.

Mr. Rorke—The survey of 1869, is that a Government survey?

Mr. Rueben—I think these monuments would definitely fix the south limits, and I would be inclined to come over and fix the north side, locating the south-west angle of lot 6 by division between lots 2 and 11.

Mr. Anderson—If you found a traverse between lots 11 and 2 that fitted in with the general occupation of the lot, what would you do? The surveyor said in his report in 1852 he followed the fence and the line of the road.

Mr. Aylsworth—That was the evidence at that time; that is the best he had.

Mr. Manser—It seems if you retrace the traverse and find it fits with the survey of 1869, everything is all right, but if it does not agree, there is nothing to do but consider the survey of 1869 is not binding on the lots.

Mr. Rueben—I would like to know how the surveyor came to establish the points in 1869, some years after the lots were confirmed by a previous survey?

Mr. Aylsworth—It looks to me when the posts were established on the south side of the road they became evidence as to the north side. Then if you come along and there is a line traced out on the north side which did not correspond with the posts, the difficulty would be in getting any further with the survey. The bearings were taken off that.

Mr. Anderson—I think you must be misinterpreting the question. If the position of these monuments is corroborated by other evidence showing the traverse in 1852 were in error, then undoubtedly you would be guided by that. There was nothing else to upset the traverse of 1852.

Mr. Aylsworth—Then you are upsetting the old posts on the strength of magnetic bearings.

Mr. Anderson—Astronomic bearings.

Mr. Rueben—I do not think the bearings mean anything when you find the monument; you have two fixed monuments; monuments are established on both sides of the road by order of the Crown and confirmed. I would be inclined to use these monuments.

The President—In order to test the accuracy of the principle, what would you take if the traverse did not come out?

Mr. Anderson—If that was the situation, you would be up against a different question.

Mr. Wilkie—Although I am a member of the Committee, I was not able to be present at the meeting where this was decided. However, I have heard of it, and I think the Committee's position is correct. As I have it from the sketch, it has apparently been a re-survey of some farm fronting on the concession, the man making his survey in 1852 followed the best information he could get. Some other man came later on in 1869 and made a survey of two lots in another concession—it might as well have been another township. He got probably the best information he could get to establish the rear of the concession. Possibly he did not get the lines that the man who re-surveyed the township in 1852 had, and he planted the posts 15 feet off. It is an easy matter to get a survey confirmed, I think. I have had two occasions where we have surveyed, and where the survey was confirmed, and there was no doubt in the world it was wrong. I think in this case the proper method to re-establish the front of the second concession is to lay down the traverse as the Chairman of the Committee had in his field notes from the two stone monuments that are existing on the ground. If you do not come 66 feet away from a survey which was confirmed in 1869, it is unfortunate and you cannot help it, you must be satisfied with what you have got.

Mr. Aylsworth—The survey in 1869 was made by the same man who surveyed in 1852. He says he came over the line he examined in 1852.

Mr. Rueben—I might ask you if, when a survey is confirmed, it can be changed?

Mr. Rorke—It cannot be changed.

Mr. Anderson—I think in this particular case the survey could not be disputed as far as concerns lots 7 and 8. When

you are considering the boundary of two lots that was fixed by a previous survey, you would be governed by the one that laid out the front of the lot definitely. The surveyor in that case had instructions to lay out 5 and 6, and the surveyor in 1869 was the man that claimed he saw the line on the north side. However, if the evidence shows that the traverse fitted between 2 and 11, and did not fit at the points established in 1869, why I would throw them out just the same.

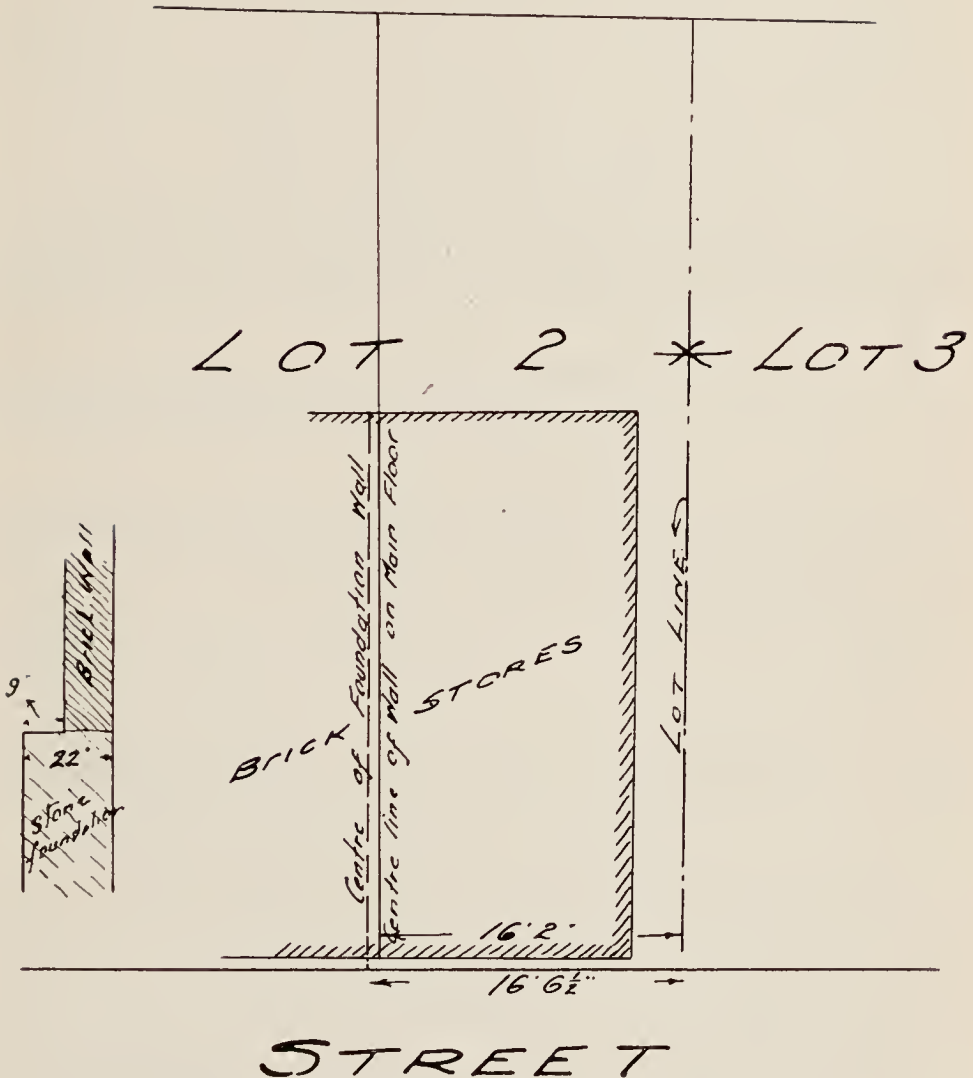
Mr. Aylsworth—If one made a traverse from the south-east corner of 11 to the south-east corner of 3 and came within a reasonable distance of these posts and followed distances and bearings and routes, why it would look very suspicious. I notice there is no monument shown on the south side of the concession road. Did this surveyor plant any posts in 1869 at 7 and 8 on the south side there? These posts on the south side are in dispute now.

The Secretary—The only reasonable conclusion you can come to is this traverse made in 1852, purported to follow the fence but did not. Later on the surveyor goes back in 1869 and says there is no good running a traverse, I followed the fence and I will come over from the fence, and we find there is a mistake of 15 feet. He made a mistake in his traverse of the fence; he traversed the fence but did not follow it; his field notes did not agree with the evidence that existed on the ground.

Mr. Aylsworth—I would like to know if the traverse was made from the south-east corner of 12 to the south-east corner of 3?

Mr. Anderson—That is a point the Committee has no information on. The question cannot be answered finally until all information is gathered together.

Question No. 2



East face of foundation and main floor walls flush on east side; nine-inch jog on the west side. Description reads:

"Thence westerly sixteen feet and six and one-half inches (16 ft. 6½ in.) to a point opposite the centre line of party wall between the store on the lands hereby conveyed and the

store on the lands immediately adjoining the west. Thence northerly to and along the centre line," etc.

Where is the west limit of property conveyed?

Answer 2—The west limit is the centre of wall at the ground line.

Mr. McGeorge—In your answer you ignore the fact that the measurement agrees with the stone wall.

Mr. Anderson—The trouble probably arose that the survey was made when the foundation walls were in. We have no evidence to show the description was followed out. The description was contained in an actual deed.

Mr. Pierce—If it had been that the foundation was partially below the level of the ground and the brick wall above that, would it still be the same?

Mr. Anderson—The brick wall was to the east. You would have to consider the condition at the time of the deed; it is more a matter of evidence.

Mr. Winters—Would it not be wiser to show two measurements?

Mr. Anderson—I think undoubtedly the surveyor would show two measurements. If my opinion were asked, and that is the opinion of the Committee, it is the measurement at the ground line, that seemed to be where the brick wall was.

The Secretary—Supposing, as might easily happen, that the foundation terminated at the ground line?

Mr. Muckleston—I don't think I have ever found out what "opposite" the centre line of the wall means.

Mr. Anderson—I think you will have to take the case to the court for that—it means at right angles to the street.

Mr. Muckleston—At right angles to the street?

Mr. Anderson—I do not know; it is vague.

The Secretary—I think the word opposite intends to imply

the shortest possible distance, and that means at right angles to the street line.

Mr. Ardagh—There is no necessity to take it that way.

The Secretary—The question was, what does opposite mean?

Mr. Ward—In connection with this question, have you looked to see if there is any ruling by the court?

Mr. Anderson—I haven't run across any.

Mr. Ward—I think there are some. I remember this came up years ago, and lawyers went into the matter; I think there is a case on it.

The President—Do you wish to have a vote of the Association on each question as you give it?

The Secretary—Take it on each question.

The President—It might be well to have an expression of approval or disapproval as to answers. We did not take it on the first one for the reason that Mr. Anderson stated the question was still open until all the evidence was in. On these questions I think it might be well to either adopt the answer of the Committee or amend it.

Mr. Anderson—I move the adoption of this portion of the Committee's report.

Mr. Wilkie—I second that.—Carried.

The Secretary—Mr. Chairman, I would like to refer to question No. 1, if I may. It seems to me it would be quite possible to get some decision. Surveyors dealing with the matter would be divided into two classes: the class which make a real survey; and secondly, the class which takes a fence. I move the adoption of the answer to question No. 1.

Mr. Rueben—I move the amendment to that. I think this question is pretty well divided. One of the members to my rear has said that the point on the ground would be the best evidence. I think it is a very wide question. They have two surveys, one a traverse and the other fixing monuments that have been found—two surveys made by the same man. I

think the monuments should govern irrespective of everything else.

The President—In order to follow proper procedure, is there a seconder of Mr. leMay's motion?

Mr. Ardagh—I second that.

The President—The amendment is moved by Mr. Rueben. Is there any seconder?

Mr. Ward—I second Mr. Rueben's amendment.

Mr. Aylsworth—I am ready to second either one. I would like to know from the survey if the traverse from between the corner of lot 12 and the south-east corner of lot 3 was re-run throughout, and how far the surveyor came away from the posts at lots 7 and 8. There is a stone post on the south-west corner of 11, also the south-east corner of 3, and the changes of bearings between are shown.

Mr. Anderson—We have not got that.

Mr. Aylsworth—I am not going to vote.

Mr. Neelands—I would like to state a case that occurred in Cobalt where monuments changed their position in a very few years. I had gone to make a survey for one company, and another surveyor who was called in for the other company had planted certain monuments correctly some years before. Coming back about five years after, he used his monuments instead of picking up the original line, and finally I asked him if he knew his monuments were out of line, and he would not believe me until he traced the line and found the monuments had slipped down. Couldn't the same thing happen in this case?

Mr. Rueben—Hardly 15 feet. It is not a case of a foot or a few inches. I think when you go into the question when it is a matter of inches it is a very different thing. When you have 15 feet it is much worse. The surveyor had these monuments and they were confirmed by the Crown, and I do not think there would be one out of a dozen that would not move a little.

The President—Shall we vote on the amendment that the posts should be adopted as evidence?

Mr. Wilkie—That is to say the monuments planted on the south side.

Mr. Aylsworth—I wish to move an amendment to the amendment that we have not sufficient data to give an opinion on this subject.

Mr. Anderson—In connection with the amendment, I would like to read the Committee's answer again. (Reads answer).

Mr. Aylsworth—I think the statement of the case is indefinite, in as much as it does not give the result of the traverse. If it gave that, and it showed the correct traverse and showed what it did originally, I would say that the post should govern. But if that evidence is not present, I do not think we are in a position to give a definite opinion.

Mr. James—The two people who own lots 7 and 8 had this municipal survey in 1869—does that establish anything except as between these two people?

Mr. Anderson—There were six monuments, the two sides and the four corners on each of these lots were marked.

Mr. James—These neighboring farms would not be called into question.

Mr. Anderson—Your point is why should the possession of the farmer on lot 6, concession 2, be influenced by what is done on lots 7 and 8, concession 1?

The President—This is a question that seems to be rather hard to get to the rock bottom of on account of lack of evidence. Supposing we assume the traverse has been checked and found to be correct but the posts did not agree. Those who would vote for the amendment and say the posts should be used in preference to the traverse, kindly vote by raising their hands.

Mr. Aylsworth—I think there is room for a first-class lawsuit.

The President—Those who would agree with the Committee's report and use the traverse.

(Vote taken).

The President—Apparently the traverse has it.

Question No. 3



Original stakes found shown thus ☐

How should Lot 23 be laid out?

How should west limit of Lot 19 be fixed?

Answer 3—Leave surplus in lot number 26 basing survey on clause in Section 13, Subsection 3, of Survey Act, requiring surveyor to follow the method adopted in making the original survey, as shown on plan and field notes. The Committee consider the position of surplus in north block the best evidence available.

Mr. Ward—Would you also put it in the rear of lot 26?

Mr. Rorke—No monuments between lots 26 and 20?

Mr. Anderson—No.

Mr. Ransom—I second the motion of Mr. Anderson's that the Committee's report be adopted.

Mr. Rueben—We are going to assume that lot 26 is a wide one because lots 9 and 10 happen to be wide. As evidence we have two monuments planted on the west limit of Blake Avenue—that seems to be pretty well established. I suppose most of these stakes were planted originally. On the south side of Second Street we have now only two indications. We assume there is no other evidence of any on the ground, and that the surveyor was quite satisfied in his mind that he had established correctly the north-west corner of lot 20 and the north-east corner of lot 26. The Act states that the whole survey surplus has got to be divided between all these lots. If you are going to follow the Act at all, I presume the Act should be followed in all respects. There is no evidence to show that a surveyor in surveying between lots 20 and 26 on the south side of Second Street, has got to take into consideration the lots on the north side of Second Street to establish limits on the south side. The Act has got to be followed and the lots proportioned accordingly.

Mr. Aylsworth—Mr. Chairman, does the original plan show the lots coincide across the street?

Mr. Anderson—Yes, the original plan shows all lots 50 feet; and the scale is 50 feet.

Mr. Ardagh—The Act says you can take a stake on the opposite side or on the centre of the road.

Mr. Aylsworth—Are there any fences in lots 20, 22, 23 and 24?

Mr. Anderson—Not as far as the Committee knows.

Mr. Rorke—I am inclined to agree with Mr. Rueben's point of view. I move an amendment to the committee's finding that you should divide up between lots 20 and 26 on the south of second street proportionately and then survey that block independently of what you find in the other blocks.

Mr. Hogarth—I second that.

Mr. McRostie—I have not got the reports here but I think there was a decision in Toronto we heard about between the Home Bank and the City of Toronto, where a principle was established a piece was taken off. I think everybody will remember that.

The Secretary—The effect of the decision in the case Might Directory versus Home Bank, was that occupation of such age that it might reasonably be directly connected with the original post should be considered the best evidence as to the position of the original post. There is no evidence whatever on the ground of this kind.

Mr. Wilkie—In substantiation of the committee's decision, here is a plan presumably as far as the plan goes true in every respect and I would be much inclined to think it is a little outside of the Act but in any event I think the lines between lots 8 and 9 and 10 and 11 should be produced south. The Act does not give any authority for producing lines but here is a matter which can be tested by the original survey. When you do that you would find a surplus in lot 26. That is perhaps not substantiated by the Act and yet on the other hand the Act says definitely you must if you can follow the original method of survey.

Mr. Rueben—If you had the stake at lot 26 what would you do—would you do that?

Mr. Wilkie—I think that at the present time I would.

Mr. Rueben—You would investigate all the evidence of the lots on the north side and fix the limits of the lots on the south from them. I think you are wrong.

Mr. Wilkie—Possibly.

The President—You have heard the motion to adopt the committee's report, what is your pleasure?

Mr. Aylsworth—I think a surveyor should throw a little horse sense into the game. I think the whole plan of survey shows each lot to be 50 feet. If you go to work to divide the surplus up, it would throw every lot out of line. I think the old way should apply, we should make the resurvey and use the same system as followed in the first survey. I would follow that, and I think, according to all the evidence that is

here, I would throw the surplus on lot 26. It would be a very dangerous thing to go into court and disregard all these lots. I think that is a thing we want to get away from today. On account of the original posts being as they are it is often absolutely impossible to find the right post in a township. There is no doubt you have it here, and I think the Judge will advise you to go the commonsense way about it and do it with least friction, and I think the way to do that is to put the surplus in lot 26.

Mr. Ardagh—I myself had a case in which I had to use judgment and did not go strictly according to the law. I have taken evidence that I found on the ground which was not sufficient for a court of law, except that the Judge might rule it was commonsense. When I was examined by the late Mr. Gibson he put a question to me which I answered strictly according to law, yet I knew I would not follow the law in actual practice if I had felt it was going to produce a state of affairs which if taken before any court of law, the Judge would rule that under the circumstances the law could not be carried out. I was asked the question again as to whether I would do that. Remember, there were a lot of men standing by me, and he asked, would you do that, and I said I would follow the law exactly, and he said if you did you would never get another survey in that township.

Mr. Rueben—I am sorry I have to jump up every five minutes, like this. I would like to know the intention of the committee, whether they would follow the Act or whether what is stated in their answer is what they would do? These plans I have in front of me show two distinct conditions. It shows one across the street and one at the corner. The evidence is undisputed, and I say that the surplus in that block, according to the Act, must be distributed in default of any other evidence.

The Secretary—It may throw some little light on this matter if I read the section of the Act dealing with these surveys. [(3) Where a surveyor is employed to establish or re-establish the boundaries of any road, street, lane, common, lot, block or parcel of land shown on any such plan, he shall follow the method adopted in making the original survey as shown on the plan or field notes and shall give proportionate dimensions to each lot shown thereon where the original stakes

defining the angles of such lot cannot be found or their position satisfactorily established]. So that is the answer to Mr. Rueben's last proposition—that the Act will permit you to take evidence from the other side of the street as indicating the method in which the original survey was made.

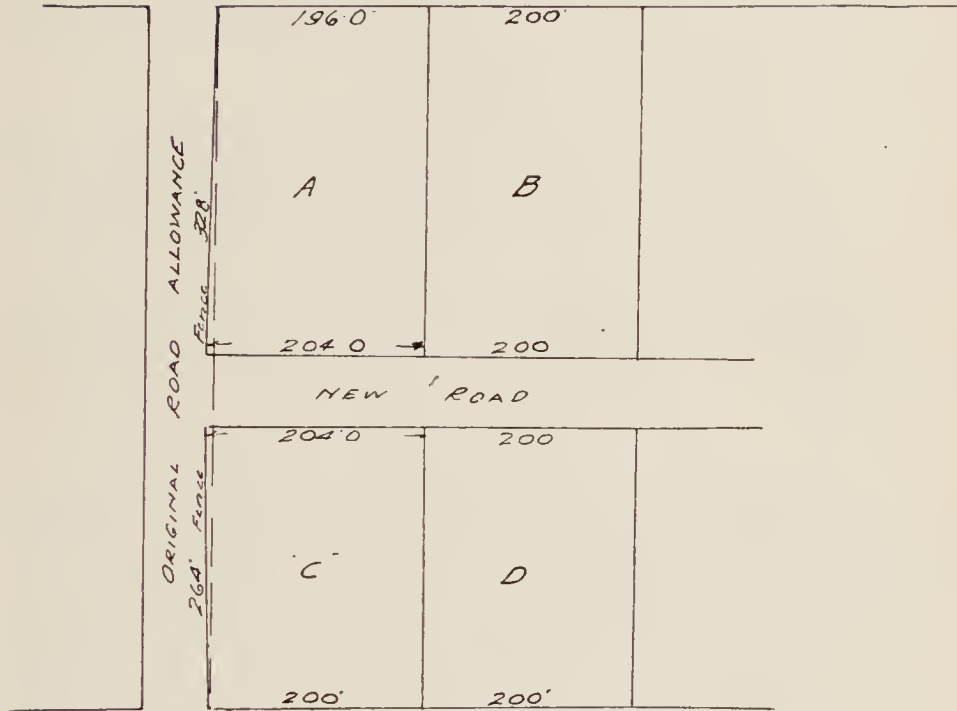
Mr. Aylsworth—I think the surveyor who made the survey was very fortunate in finding the post where he did. I think that too much time is spent in finding these posts.

The President—Those who are voting for the amendment to divide the surplus between lots 20 and 26. (Lost).

Those who vote for the motion that the surplus go in 26. (Carried).

Mr. Anderson—Well, having decided how we are going to fix the boundary of lots 23 the answer to the second part follows, you would measure for that plan distance from the line between 19 and 20. I do not think there is any argument there.

Question No. 4



True limit of original road not marked on original plan. Coloring, however, does not extend beyond true limit.

Measurements are to fence.

Owner's certificate reads: "The portions of this plan colored pink and brown have been laid out according to our instructions."

What is west limit of Block A.?

Answer 4—The west limit of Block A for survey purposes is the fence.

The Secretary—In other words, the first 50 feet would only measure 44 feet.

Mr. Anderson—I will move the adoption of the committee's report on question 4.

Mr. McRostie—I second it. Carried.

Question No. 5

(a) Does the title limit of lands bounded by the shore of a lake, or the bank of a river, remain in its original position if erosion or accretion takes place.

(b) If so, in the event of accretion beyond the original limit, does the title holder lose the right of access to the water for such purposes as watering cattle, building docks, etc.

(c) What is the effect of a sudden shift in the position of the bed of a river.

Answer 5—The Committee considers the Section of the Dominion Lands Manual (Sec. 135) dealing with this subject is probably as clear a statement as can be given of the general rule.

“Where the land is slowly and imperceptibly added to, either by alluvion or by the recession of the water of a river or lake, whether navigable or not, the new land thus formed belongs to the riparian owner in front of whose land it is formed, and the process is held to be imperceptible where its effects are so gradual that it is not discernible from moment to moment, though the fact that there had been an increase in the land may be perceptible from year to year or at shorter intervals. The converse is also true, that lands gradually encroached upon by the water upon which they border cease to the extent of the encroachment to belong to the former owner.

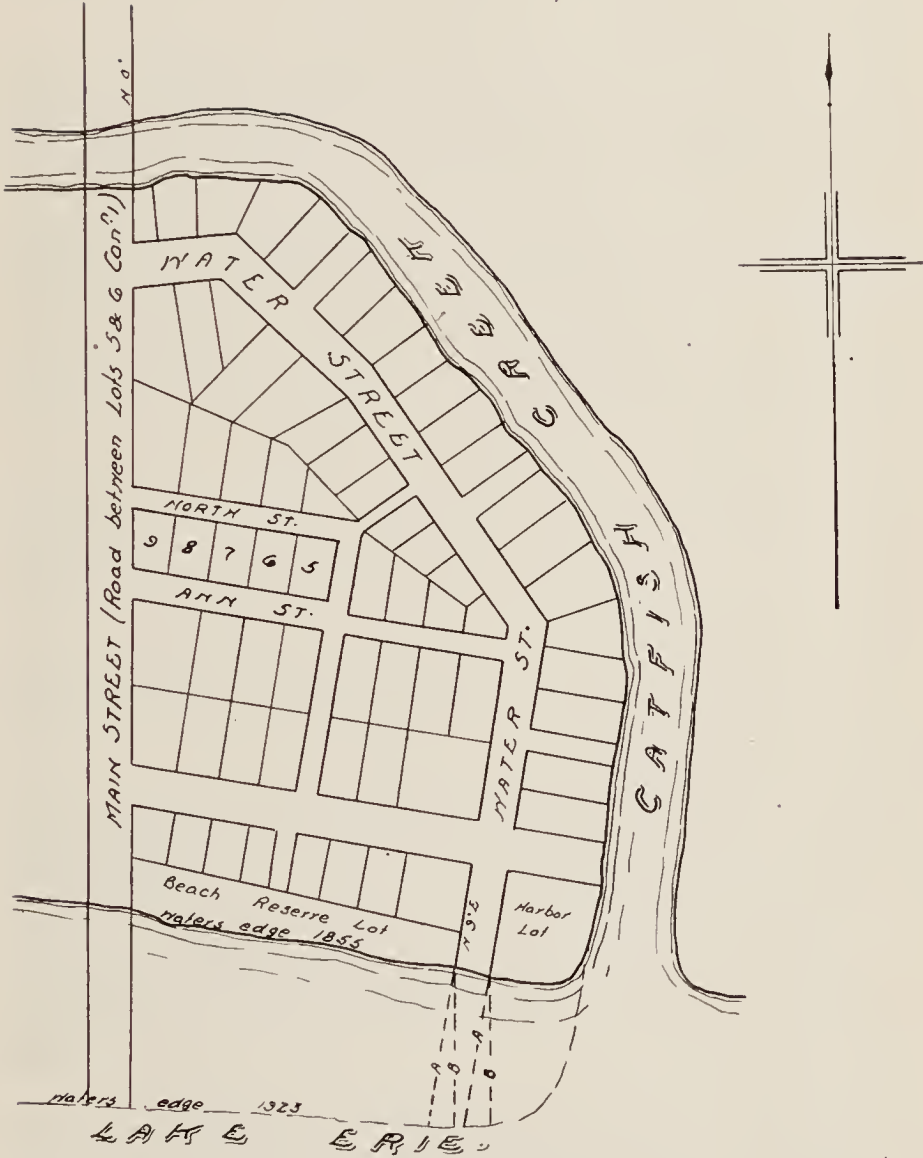
On the other hand, sudden and sensible additions to or subtractions from lands, arising from similar causes, do not cause any change in ownership.”

Mr. Anderson—There seems to be a little haziness in the authorities as to what is required to fix a water boundary. The Secretary heard that the committee was investigating the matter, and he asked me to read a paper which I propose to read later, and I think the discussion might very well fit in on that paper. If that is satisfactory to the meeting I will do that. I would move the adoption of the committee's report in answer to question 5.

Mr. Ward—Seconded. Carried.

Question No. 6

QUESTION 6



The accompanying sketch is a copy of a portion of Registered Plan Number 5, filed in 1855. No measurements are shown on the original plan, but it seems to be drawn very accurately to scale. The depths of the lots between Ann and North Streets, scale exactly 1.50 chains and the distance between North Street and Water Street, on Main Street, scales about 4.95 chains.

In 1872 the Judge of the County Court ordered specified alterations and amendments to be made to the plan of the Village. No mention was made in his order covering any portion of the territory shown by the accompanying sketch.

The same surveyor filed another plan of the whole Village in 1872, which was Registered as plan number 55. He included the part shown on the accompanying plan, and on this plan marked the depths and widths of the lots. The depth of the lots between Ann and North Streets was given as 2.00 chains, and the distance between North Street and Water Street, on Main Street, as 4.45 chains.

The land between Ann Street and Water Street was never built upon, and no trace can be found of any original posts.

Query 1—In laying out North Street what depth should be given to the lots between Ann and North Streets?

Water Street was registered to the water's edge, but in later years piers have been constructed at the mouth of the creek and an extensive beach has formed in front of the land, as shown on the sketch.

Query 2—Should Water Street be extended parallel to the original lot lines, as shown by the lines B.B., or should it follow the southerly extension of the street, as registered, as shown by the lines A.A.?

Answer 6—Query 1—This question was submitted too late for the Committee to get further information required.

Query 2—Extend Water Street across accretion on production of land lines.

Mr. Anderson—There are two other questions that came to the committee too late for discussion. There was one question that came too late for discussion, and question 6 came too late for me to get the information which I considered

was needed in connection with it. That is question 6 on the list and blueprint attached. I do not know whether the person who sent this question in is present, but I think it would be desirable that the question be taken up at the next annual meeting. I move it be left over.

Mr. Bell—I would rather have it settled today.

Mr. Anderson—The information we have on this question is this—Mr. Bell will correct me if I make any errors. This plan was laid out in the early days, and it showed no actual measurements on the plan at all. The tier of lots between Ann Street and North Street scaled on that plan a chain and a half and from North Street to Water Street limit along Main Street it scaled 4 chains and 95 links. In 1869 another plan was made under an order given by the Township Judge which made certain amendments in another part of the village, not shown in the plans, but the plan included the portion here shown, and showed the measurements of the lot had increased 50 links from the scale measurements of the original plan, and the lots north of Water Street were reduced to a corresponding extent. The question is, what is the depth of the lots between North and Ann Streets? The committee felt they could not properly answer the question without knowing how the title stood at the time plan 55 was put on, whether the lots north and south on North Street were in the same owner, and how the lots were held, whether under plan 55 or not.

Mr. Bell—The first plan was drawn very accurately to scale. On the lots south of Ann Street the measurements on the second plan agreed exactly with the measurements on the first plan. The second plan was drawn very poorly and you could not scale any lot. I think that land was never built on, and I think it is in the same owner as when the first plan was made—and had never been built upon at all. The Judge's order did specify what alteration was to be made—some lots were to be left off the next plan, but he made no mention of this property.

Mr. Anderson—Do you know whether the lots are held under plan 55?

Mr. Bell—I would not be sure; there is no evidence on the second plan. The owners of the village petitioned the Judge to have changes made.

The Secretary—Do I understand that no authority whatever for including this portion of the village upon the second plan had been given. It was done by the surveyor without authority?

Mr. Bell—For this particular piece he had no authority; it was done under the Judge's order. That is, only a small part of the village; he had authority to change the different parts, but nothing in the order covering this part.

Mr. Anderson—The plan was put on as a result of the Judge's order—it was not signed by the village.

Mr. Bell—No, three men own the whole village, and they petitioned the Judge to have certain alterations. They wanted a certain number of lots left off, and he made an order, but did not include this part.

Mr. Aylsworth—But the surveyor just included it on the plan.

Mr. Bell—I suppose so.

Mr. Aylsworth—What is the conundrum now?

Mr. McRostie—I think if the owner had title to this block of land under the plan 55 and the owner did not give his consent to the new plan being put on, I do not think it is worth the paper it is drawn on.

Mr. Aylsworth—I do not see what the conundrum is; it is a difference of opinion, and the surveyors would be guided by the original subdivision.

Mr. Anderson—In addition to this question it was suggested during the year it was desirable in this Province to have a Board composed of surveyors to deal with disputes arising from matters of survey. It was the unanimous opinion of the committee that such a Board would be highly desirable, from a land surveying standpoint, and the matter was passed on to the Legislation Committee, as it was felt that the details were a matter for that committee, rather than for your Land Surveying Committee. We referred the question to the Legislation Committee, and I believe they have a report on the subject.

Mr. Bell—May I ask a question as to how to lay out the end of Water Street?

Mr. Anderson—There is a second phase to question 6. On Water Street the land at the end is not the same as it was and the question arose as to the proper method of extending the limits of Water Street, whether it should be drawn parallel to Main Street, and the committee is of the opinion that the line of Water Street should be extended.

Mr. Bell—This land is getting worse all the time at the beginning of Water Street.

Mr. Anderson—There are two arguments in favor of extending Water Street: One is from the analogous clause in the Act in reference to closing roads, and, secondly, it is at right angles to the water's edge.

Mr. Rorke—Well, this case is under practically the same heading as that question we had a year ago from Port Colborne. The decision that was applicable to that would be applicable to this.

Mr. Anderson—That was the interpretation.

The Secretary—The question was whether it was a production or not.

REPORT OF COMMITTEE ON DRAINAGE

To the President and Members of the Ontario Land Surveyors' Association.

Gentlemen:

Your Drainage Committee begs to submit the following report:

The year 1923 has had but few important works carried out and no important decisions rendered in connection with drainage matters. There has been no amendment to the Drainage Act, and all in all, the past year has been a remarkably quiet one so far as drainage matters are concerned.

The decision of the Drainage Referee in the case of the Pere Marquette Railway Company vs. The Township of Sombra, has definitely settled the law with regard to the interpretation of the sections of the Railway Act relating to drainage works on Railway Lands. By this decision, it is made clear that the Railway Company is not liable for the extra cost of constructing the drain above or below their own lands by reason of the fact that the Railway forms a barrier to, and prevents the passing of a dredge or ditching machine above or below the tracks. The liability of the Company ceases at the right-of-way limits in so far as the work is concerned, and it is the duty of the municipality to get the work done outside of the Railway right-of-way as best it can.

The work under the Ditches and Watercourses Act remains unsatisfactory. It would appear to be necessary to re-cast the Act before it is made properly workable in the different parts of the Province. We recommend that the necessary steps be taken to have the following changes made in the said Act at the present session of the Legislature:

(1) After the word "stead" in the sixth line of Section 5, the words "of which he shall have had notice" be inserted.

(2) That Sub-section 2 of Section 14 be struck out and the following inserted in lieu thereof:

Sub-section 2, Section 14:

"After the receipt of the same by the Engineer, he shall give the Clerk not less than ten clear days' notice in writing,

of the time and place at which he will attend in answer to the requisition."

(3) That Sub-section 3 of Section 16 be amended by striking out the word "thirty" and putting in the word "ninety" in the third line thereof.

Attached hereto are a number of questions which have been submitted to your Committee for consideration, and the answer of the Committee to each question is given in connection therewith.

All of which is respectfully submitted.

J. J. NEWMAN, Chairman.

Question 1—Proceedings were instituted under the Ditches and Watercourses Act, and at the first meeting, an understanding was reached, but the understanding was never reduced to writing. One of the parties went on and did what he understood was his portion of the work, and the other party did some work, but not enough to satisfy the party who initiated the proceedings. The party who initiated the proceedings then filed a requisition for the Engineer, and the Engineer made an appointment. The other party, through his solicitor, objected to the appointment, on the ground that an agreement had been reached and that a requisition could only be filed in case of a disagreement and consequently the party must start all over again and hold his initial meeting.

Is a verbal agreement an agreement within the meaning of the Act, and had the owner the right to file a requisition, without starting proceedings anew?

Answer—An agreement, unless reduced to writing, and filed with the Township Clerk, is not an agreement at all, within the meaning of the Act, and hence the owner could proceed with the requisition without starting proceedings over again.

Question 2—A natural watercourse, following a small ravine or depression, has been improved under the Municipal Drainage Act, but not to its outlet, the work being stopped at a point where, when the River is raised by canal construction, the channel will be continually under water. The owners of lands immediately below the termination of the excavated portion of the drain have threatened damage action, and the municipality has asked for a report under the Act, on the

cleaning out of the remainder of the channel now obstructed by a growth of brush, although this watercourse is not a Municipal Drain. I will be obliged to report under Section 9, Sub-section 6, that the matter can be settled at less cost by allowing compensation. It would seem to be advisable to estimate this compensation for a period of five years, and at that time, if the lands are flooded by the Department of Railways and Canals, they will have a certain responsibility which they would expect to assume. I take it that the municipality is responsible for any increased flooding caused by improved drainage on lands lying above. Does the Section of the Act referred to, permit of a settlement being made for the above mentioned time only? It is apparent that there is only a small amount of increased damage, as in a state of nature the low-lying lands along a creek bottom are always flooded in time of high water.

Answer—The section of the Act referred to, provides for compensation for damages in lieu of taking the drain to an outlet. Such damages will be permanent so long as the nature of the drainage above remains substantially as contemplated by the report. There seems to be a repetition of provisions in the Act, viz., Sub-section 6 of Section 9 and Section 79 of the Act.

Question 3—In a supplementary assessment to provide sufficient funds for the completion of the portion of the drain on which excavation was carried out, more than enough money was provided. The municipality has kept this money. Is there an objection to my report directing that this money be applied to such compensation, since the same lands, originally assessed, are the lands responsible for this settlement for outlet?

Answer—Yes. The money must be used for the purposes for which it was raised, or refunded as provided by the Act.

Question 4—Two owners prepare a written agreement for the construction of a ditch which they sign, seal and register in the County Registry Office. One of the parties refuses to carry out the agreement and the other serves you, as an engineer, with notice to enforce it. What steps will you take?

Answer—The Engineer has no jurisdiction unless the agreement is made under the Ditches and Watercourses Act, and filed with the Township Clerk.

Question 5—Under the Ditches and Watercourses Act, the Engineer can get a good outlet for the lands above, on the

7th Lot, with well defined banks, and the estimated cost is less than the \$1,500.00; half a mile down the drain on the second and third Lot below the proposed outlet, the owner objects to the water coming down as it would flood and damage his land, which is low, and on account of there not being any well defined banks the water spreads over about twenty acres of land. Would the Engineer be justified in making an award?

Answer—No. By Sub-section 1 of Section 6, the ditch must be carried to a sufficient outlet, and if the water brought down by the ditch will damage the lands of an owner, a short distance lower down, the Engineer is not justified in making an award.

Question 6—In September, 1868, the Township of Middleton, in the County of Norfolk, passed a by-law for the construction of what was known as the Union Drain. The report, plans, specifications and assessment were prepared by Thos. W. Walsh. This drain was continued into the Township of Walsingham.

The Engineer's report is not incorporated in the by-law of 1868, and apparently the Municipality cannot produce it, so that we have no record of who, by the report, is required to maintain the ditch.

In 1906, a petition was received by the Council of the Township of Middleton, asking for the drainage of certain property affected by the Union Municipal Drain. By the report made to the Township on the 6th of July, 1906, by Jas. A. Bell, he repaired and improved what was known as the Union Drain, allowing for the enlargement of bridges, but apparently not continuing the drain as far down stream as it was continued before, but stopping his work in the Township of Middleton. By this report the drain was to be maintained by the Township of Middleton at the expense of the lands and roads in both Municipalities.

An owner of land in Lot 11, Concession 14, in the Township of Walsingham, which was the outlet of the original drain by Walsh, is claiming an order of mandamus directing the Township of North Walsingham to repair and maintain the Union Drain from the point where it enters her property at the Town Line between the Townships of Middleton and North Walsingham in such a manner as to secure proper drainage.

Enclosed is a plan of this drain. Does it appear to the Drainage Committee that action of the owner of Lot 11 is against the Township of Walsingham or against the Township of Middleton to have the condition complained of rectified?

Answer—It is the duty of Walsingham to maintain the drain within its own boundaries. See Sub-section 2 of Section 73 of the Drainage Act.

Mr. Newman—I would like to mention since the Drainage Referee came today he pointed out the distinction between the provisions in the Act, under 69 and under 79—Section 79, refers to work done under the provisions of 77 and 57, and sub-section 6 of 69 refers to original work.

The Chairman—That question is open for discussion if there is any discussion or questions to ask.

Mr. Scott—Compensation then does not apply to the repair of the existing drains?

Mr. Newman—Yes, you could allow for it under Section 79 and not under sub-section 6 of 69. It works out to substantially the same thing, but it is not on limited terms.

Mr. Scott—Then in that case the procedure is to make a settlement and look for the other party to reimburse.

Mr. Newman—I doubt if you would get a reimbursement. I am afraid you would be obliged to settle and let the land-owners take the chance afterwards. (Reads question 3 and answer). Were the quantities small it might be advisable, although not technically right, to put that money in the credit of the drain and allow it in the compensation rather than go to the trouble of refunding it, and not re-assessing it—it seems simpler and a shorter way of doing it, and in all probability you will get by with it in a small way. We all think the answer is correct—it is not in accordance with the Act.

I have here one question which came in subsequent to the preparation of the report. The question is fairly long. (Reads question and answer).

The Chairman—You have heard the report. This raises a good many interesting questions and probably you would like to discuss some of them; the matter is open for discussion.

Mr. McCubbin—I think I may claim a fairly long memory in regard to some of these problems, but there were drains constructed before we had the Municipal Drainage Act. I don't know how it was done; I think these drains were constructed under the Act called the Ontario Drainage Act. I may be wrong in regard to that and I think the drains were called, not municipal drains, but Government drains.

And how ever they were constructed or how ever they were called, I have no doubt about the answer given by the Committee, the duty of the upkeep of these drains is cast upon the municipality. The Referee is here and his memory is no doubt longer than mine. I would like to know about the origin of the Municipal Drainage Act.

The Chairman—We would all be glad to hear from Mr. Henderson; we always get a good deal of information from what Mr. Henderson says to help us in the work of our profession.

Mr. Henderson—Mr. Chairman and Gentlemen: I am always glad to be here, as most of you know, and I see here today some new faces belonging to some young men, and therefore I am going to take the liberty of repeating something which I have said in this room on previous occasions. Mr. Newman's report stressed the fact that there has been very little drainage litigation during the year 1923, and I want to tell this to those present that I have a strong view as to why that is. I said to Mr. Rorke before coming into the room, I recall one morning, some years ago, I met yourself, sir, and Mr. McCubbin, and I think Mr. Newman with him, and these gentlemen got me to one side and proceeded to ask me in a deprecatory manner some questions about the Drainage Act, and when I asked them what they meant, I found out it was a question that was going to be answered in the afternoon in the meeting which corresponds to this. After a moment I told these gentlemen if by any possibility the discussion could be deferred until after 4 o'clock—as I happened to be in the Court of Appeal that day—I would like to come to the meeting. I came, and was received with that warmth of welcome which is characteristic of your Association, and I have been coming ever since, excepting on one occasion when I couldn't possibly come. The result has been a personal touch with the engineers, which as a matter of cold calculation has saved the people of this Province a very

large amount of money. Not merely in connection with the work itself, but in stopping litigation before it commenced. It is quite true, sir, there has been very little drainage litigation in 1923, but the year 1923 was, to me, conspicuous for the number of letters which I received from Engineers, Reeves, Township Clerks, and very often private owners, wanting to know things of one kind and another about work, and their duties under the Drainage Act.

Instead of sitting in a court room day after day and litigating at great length and great expense, the difficulties are met in advance and the construction work is going on just the same. I think you will all agree there is a great deal of drainage work going on now. Difficulties arise, as they did before. I would like to feel and think this is due to the good sense of the engineering profession that these difficulties are met at the proper time and straightened out before litigation commences. That is why I am so glad to be here, but not only that it is very delightful to me to meet those who I regard as my personal friends.

Another result is when we do come together, it is not a case of a man going into the witness box to tell his story under cross-examination by lawyers, but we get together and talk things over and find out how things are. I remember one night I found myself on the way to Palmerston. I did intend to go to Guelph. By accident I went to the hotel and found the engineers and lawyers on both sides. The Drainage Court was to assemble the following morning, but as a matter of fact the real work was done at the hotel with our pipes lit, and we sat around the table in the hotel, and before we went to bed we knew exactly what was going to happen the next morning. I call that commonsense business; we get somewhere, and it is much better and more satisfactory. The thing I want to impress upon the younger men, those who do not know the ways of the Drainage Referee, that any engineer who is entrusted by a Municipal Council to make a report under the Municipal Drainage Act is as much a judicial officer as I am. The moment he takes that office he is a judicial officer, and he is entitled to any assistance I can give him. My address is Ottawa, and any time any difficulty arises I welcome a letter from any engineer concerning any question which may arise with him. There are sometimes cases which I cannot answer without hearing both sides, but in 99 cases

out of a hundred I can be of assistance to engineers, and want to be of assistance, and I say that in the most sincere way. As to the questions that arise upon this report, I would be pleased to answer any question. I had a short discussion with Mr. Newman before the meeting commenced, and I can only say I concur in all the answers he has given. Let me explain those two sections in the Drainage Act respecting repair, and also sub-section 6 of section 69. There was no provision in the Act before that for awarding compensation in the case of an original report under sub-section 6 of 69, which gives the right to award compensation in the case of an original report. This does not apply to flat lands around Chatham, coming down through an undulating country, broad and long. I am speaking as regards the matter of debt which will answer the purpose. You can trace a line on your profile, and when you come to a depression that will not be taken care of the claim that can be made arising out of that will not justify the greater expenditure of money. A drain deep enough to allow for depression is entitled to compensation. In the outlet you would have to make the drain the full depth for some considerable distance in order to make a complete outlet. You are bringing down water and if you do not give the complete outlet you must compensate. That is what that Section means.

One other little point I should explain: Where compensation is awarded the engineer who asks the question finds himself in the position of intending to make a report awarding compensation. He happens to know that there is in the hands of the Township Treasurer the sum of his unexpended balance of an amount allowed for proposed scheme. He asks whether he can recommend whether that unexpended balance can be used.

Technically, the County is absolutely right in saying no, the Act does not provide for it. After all it is a matter of debtor and creditor, and there is an amount lying there in the hands of the Township Treasurer today in respect of it, and the Township is the debtor to the individuals who were assessed for the amount of which that is the balance; it stands there. A report comes in with an assessment, and if the amount of the assessment is substantially the same as the amount standing to their credit, then it is absolutely an automatic set-off, and in that case the Engineer could do it,

but if the amount lying to their credit is larger it may be that this amount would be applied if the party interested desires to take advantage of the usual provisions of paying the Council for the trouble they might be put to, and they are entitled to receive back by way of compensation whatever might be included in the Engineer's report. That is the commonsense way of doing things. If he is going to take a small amount he could very well recommend that the amount be used. These are the only things that occur to me.

By the way, the decision referred to in the report is one which has given me a good deal of concern. 'I think I was right, of course, in the decision, but it leaves an unfortunate condition of affairs which should be remedied by legislation, but just who is the proper one to take steps to that end, I do not know. Municipalities have no organization. I do know, in the past some very important amendments to the Municipal Drainage Act have been brought about on the recommendation of Municipalities, and whether or not these Municipalities could approach the Dominion Parliament is another question. Quite clearly the intention of the Legislature was that the railways should give away to agriculture. That has not been effectively brought about by the Section as it now stands, and notwithstanding what the railways may think about it, if there were a public demand made I would feel bound to recommend the Act should be amended so as to properly comply with the public spirit. At present the effect is that drainage work may be rendered very much more expensive, and possibly in some cases prohibitive, because the drains cannot be taken over a railway.

This is an important Act, and worthy of the consideration of this body.

The Chairman—I think we have got to the happy stage in our relations with the Drainage Referee that no formal vote of thanks is necessary—a formal vote of thanks would be out of order. I know it is not out of order for me to try and impress upon Mr. Henderson the appreciation of the Association. As one who is pretty constantly interested in drainage matters, I think I can say that Mr. Henderson's visits with us have been of great assistance to me and to all the other members who are interested in drainage work, and I feel he will appreciate our appreciation of him, that he will realize we appreciate his coming here.

This report is open for discussion and we would be glad to hear from any member or receive a motion to dispose of the report.

Mr. Newman—If there is no further discussion in connection with the report, or arising out of the report, I would just like to make one statement, and that is I received a letter a few days ago from Mr. Gray of Leeds, who is a member of our profession and a member of the Provincial Parliament as well, asking for some amendment. I replied direct, asking him, if possible, to be here yesterday morning, and if not possible, to let me know where our committee might meet him and discuss the matter with him. I have not heard directly from him, but through Mr. Rorke I was told about 12 o'clock today it was impossible for him to get around.

REPORT OF COMMITTEE ON ENGINEERING, ROADS AND PAVEMENTS

To the President and Members of Ontario Land Surveyors' Association:

Gentlemen,—The past year, while being one of general depression over the Dominion generally, has not been one without activities peculiar to those engaged in the practice of Engineering and the allied work of roads and pavements.

Railway Engineering, and works incidental thereto, have been somewhat revived by the construction of branch lines and extensions within the Province, mainly in Northern Ontario, giving access to areas of promising mineral development. In some of the older parts of the Province attention is being directed to the conversion of steam lines into electrically operated systems, and with the steady development of electric power with its future possibilities with the economic problem of fuel supply it would seem that railway Engineers should give this phase of the problem every consideration. The development of the storage battery driven car has also been undertaken, and the operation by this system has been successful, particularly in isolated sections of the country.

The successful completion of the Hydro-Electric Chippawa plant is one of the outstanding power development schemes of the year, and it is gratifying and a matter for congratulation that practically the entire work has been under the control and supervision since its commencement of Canadian trained Engineers. It is also worthy of mention that there has been a ready market for all the power developed at the Chippawa plant, and on the return of normal trade conditions there will be a ready sale for more power than is at present available.

The Northern Ontario power development has been active during the past year in the commencement of several large developments in connection with the mining industry, tending to show that this industry has assumed definite proportions of permanency justifying large expenditures in power plants for its economic development.

The St. Lawrence River Power Development scheme is receiving attention at the present time, and with the scarcity of power it would seem that an amicable international agreement can be reached with lasting benefits to the two countries.

The Welland Ship Canal programme is proceeding with several contracts for large amounts pending, and on the awarding will give employment to a large number of men. The canalization of the St. Lawrence and the construction of a deep sea waterway is progressing and it is hoped will be brought to a successful conclusion, and in this connection it might be well to sound a note of warning of the proposed Chicago drainage canal which would seem to be also ultimately proposed as a development of the Mississippi Route for shipping with water that will be necessary in the development of the natural St. Lawrence Route. Your Committee would strongly recommend that any weight which this Association may exert may be brought into action in assisting to prevent further Chicago diversion of nominally Great Lakes water.

The Roads and Pavements branch of the Engineering profession has been quite active during the past year in Provincial, County and Township organizations. The Provincial system of roads has progressed in the completion of many miles of improved highways, while nearly all of the counties have completed a considerable mileage of secondary roads. It would seem that the paramount difficulty at the present time is the question of financing the various undertakings. There is a most persistent demand for improved highways of all classes, and to accede to such demands indiscriminately would be likely to lead to an almost impossible tax burden. It would appear to your Committee that an exhaustive study should be undertaken of the highway requirements of the Province with a view to co-ordinating in some measure all highway activities; to study and suggest proposed methods of finance after investigating sources of revenue and as to when and how and in what proportion the cost of roadways shall be borne by the various interests affected. This study should also, we believe, designate traffic zones in which type of roadway to be constructed should have consideration. There is no doubt but that the Canadian Engineer is eminently capable of designing and building roadways of any type, but the individual Engineer does not have the broad Province-wide viewpoint he should have in order that his individual work may link up in co-ordination with the work of all departments of road-build-

ing throughout the Province, so that on the final completion of an individual programme it is a link only in the final scheme pre-determined of an economic, efficient and co-ordinated highway system.

The past year has been of interest to your Association in the organization of the Association of Professional Engineers of the Province of Ontario. The formation of this Association was made possible by the passing in 1922 of the Professional Engineers' Act. The terms of this Act are broad, and by it all the registered Land Surveyors of the Province are admitted into membership, and from the last report of the Association some 118 members of the Surveyors' Association have become members of the Engineers' Association. It would seem to your Committee that the close co-operation of these two Associations cannot but work out to the advantage of the members of each.

Respectfully submitted by your Committee.

F. N. RUTHERFORD, Chairman.

COMMITTEE ON LEGISLATION

Your Committee on Legislation begs to report as follows:

Owing to the early close of the Session of the Legislature last year, the Bills providing the amendments to the Ontario Land Surveyors' Act with respect to examinations and certain minor amendments to the Survey Act were not introduced.

Steps are being taken to have these matters attended to this year, as well as the report of the Special Committee on Registry Offices referred to in the report of the Council of Management.

Your Committee has given some consideration to the question of the settlement of boundary disputes in some more simple and less expensive manner than obtains at the present, and, it may also be said, in some manner that promises the correct solution in the shortest time. It is the unfortunate fact that in many of the more important survey cases in recent years, two or three references to higher courts have been necessary.

In 1838 an Act was passed establishing boards of boundary commissions consisting of three, including one surveyor in each district, who were required to attend within ten miles of the spot and determine the matters in dispute. An appeal was allowed. This Act was in force for four years.

In 1887 an attempt was made by this Association to revive this statute in a modified form. A draft Bill was prepared and approved and forwarded to the Government with representations as to its desirability. Nothing appears to have been done. There appears to be two other alternatives:

(a) The appointment of an official referee as in drainage matters, with an appeal to the Appellate Division.

(b) An amendment to the municipal survey clauses in the Act making it obligatory for the municipality to take action on the petition of one of the parties to a dispute.

Your Committee has discussed this matter at some length and has come to the conclusion that the following amendments

suggested by Mr. Rinbee would meet the purpose, and recommend that steps be taken to secure the same.

Section 17 (1)—Eliminate lines 1, 2 and 3 and the word “motion” in line 4 and substitute the following:

“Upon the receipt by the Municipal Council of any Township, City, Town or Village of an application from any one owner for a Municipal Survey of his lot or from one-half the resident landowners, where more than one lot is affected, such Council shall, or upon its own motion may, adopt a resolution stating, etc.”

Add a new sub-section 2 as follows:

“In the performance of this survey should it be found necessary to establish the limits of any streets or lanes or the exterior boundaries of the block or sub-division in which the land to be surveyed is situated, such limits or boundaries shall, subject to the approval of the Minister, be marked and confirmed as part of the survey.”

Change the present sub-section 2 to number 3.

Your Committee has also had under consideration the need for compilation of Survey Acts with a view to noting difference in methods, these being important because no Survey Act is retroactive, and there should be available for every Surveyor an analysis of these Acts for reference purposes.

The Secretary—Mr. Chairman, with your permission I would like to ask Mr. Lee to elaborate the suggestions he makes.

Mr. Lee—Mr. Chairman and Gentlemen: The need for this change in this Section of the Act respecting surveys of land came to our attention by the fact that in a certain instance an owner asked for a survey. The adjoining owner was not satisfied with it and employed a second surveyor, and eventually two surveyors attempted to determine a line. It was impossible to get any information of the original survey and you will realize that the survey was very difficult. A third surveyor was called in and the three surveyors differed. One of the owners made application for a Municipal Survey, because he thought that would be confirmed and would be final. Application was forwarded to the Municipal Council, but realiz-

ing there was a good deal of difference of opinion the Council did not pass a resolution forwarding the petition. Our idea is to change Section 17 of the Surveys Act to make it compulsory that the Municipality forwards these petitions. The owner wants it and is willing to pay for it, and it would seem he ought to have it. Mr. leMay has suggested possibly a Commission might serve the purpose. That he thought might be simpler or easier than a municipal survey. I scarcely agree, and I think that the Committee are agreed that the Act in force is probably the better way. The second amendment suggested is this, under the present Act the Municipality is not obliged to have monuments planted on blocks or sub-divisions, which it may be necessary to establish in making a municipal survey. In making a survey certain block corners may have to be established. If these are not included or marked very often they are lost, although they may be used in establishing a particular road; we feel by changing Section 17 it would be made compulsory that the Municipality forward the application of the owner and have a Municipal Survey made. The owner wants it and is willing to pay, and he is entitled to it. In making it, certain block corners are to be established and they should be marked and should be included. We felt if the surveyor had to determine what block corners should be established there might be a complaint from the Municipality. If that is left within the jurisdiction of the Minister then they would possibly have no complaint. For that reason these two amendments are suggested, I think the Act is now clear on that point.

The Chairman—What is your pleasure on this report, gentlemen?

Mr. McRostie—While you are on this point of amending the Act. When you are called upon to make a survey of a disputed line there is usually a row started, and that gives the surveyor a lot of trouble attending court, for which the Act provides the surveyor should be paid \$5.00 a day. I think that part might be changed, too.

The Secretary—I would suggest this, that with regard to technical disputes they are more easily and are probably better determined by a technical man than by other persons, since the technical man must learn the subject from the beginning. A Municipal Survey is in effect a reference to a technically trained man. I move the adoption of the report.

Mr. Bolton—I second it.

Mr. Reuben—I am not quite clear on the amendment, the first amendment included in the report.

The Chairman—One of the recommendations of the report is that the suggestions of Mr. Lee be adopted, and an effort be made to have the amendments brought into effect.

Mr. Rorke—I may say in addition to what Mr. Lee has said—I quite agree with him—that in making these Municipal Surveys that if only one line is necessary that the surveyor very often has to fix the corners of blocks, and his survey depends altogether on the fixing of these blocks, and I think there should be some machinery to provide that such corners should be monumented. I do not know whether the confirmation of the survey of the one line would fix them, though I think the field notes probably would show them. I agree that these blocks should be fixed, and the cost may be dealt with by the Municipality.

Mr. Ardagh—I also agree, and I just completed a Municipal Survey in which it arose. I had to run a line parallel to the governing line and the governing line was not included in the instructions, and as a consequence I had to run the governing line before I ran the line that was included. It seemed to me it was putting the cart before the horse.

The Chairman—The point of the Committee is that the survey should take in the points that are necessary as well as the one in dispute.

Mr. Rorke—It seems the instructions to the surveyor would have to include that; it would have to be enlarged before instructions went out.

Mr. Lee—I would be afraid the surveyor would not know what is involved. If his instructions covered a survey of the lot in question under Sub-section 2, which we propose to insert, the Minister would have power to include all the block corners he would deem necessary as part of the survey. Municipalities might have some objection if the option were left with the surveyor, but if it remained with the Municipality they would probably have little objection. It is quite evident it is necessary. While we do not want to force municipalities into things, they probably have to pay for it and they

want to say how much should be done, and if they are instructed by the Department that certain block corners are necessary we would feel they would be satisfied and would be willing to pay.

Mr. Reuben—I think it would be pretty hard on the municipality to say to the surveyor, “Well, go on and survey this lot here, and in doing so you had better block out the four corners, or block out these two ends and start your survey from this end.” I think if the surveyor went out he would likely have some information and would likely use certain corners of the block for the survey. It would be sufficient to serve as a future reference for the work he has done. It would be very hard for the Minister, or who ever it is in his office, to say to the surveyor, “I think you had better monument two certain corners,” whereas the evidence of the location of the other two corners might have been easier or more accurate. It is a very hard question, and I think it should be left to the judgment of the surveyor.

Mr. Rorke—If you are making a survey of a lot within a block in a city or town it would be necessary to get all the block corners established on the street.

The Secretary—May I ask what about Mr. Ardagh’s question? He was asked to define a governing line.

Mr. Rorke—In that case he is required to get that governing line in order to run other lines. That is necessary and becomes part of this work. I think his notes of the survey would depend upon the governing line.

I am inclined to think if the survey was confirmed on the basis of the governing line, any future surveys would have to conform to the governing line.

The Secretary—It might as well be monumented to make it easy for the next man.

Mr. Rorke—The explanation of the matter, as Mr. Reuben says, is up to the Minister.

Mr. Lee—Mr. Rorke has to decide whether the information submitted in the surveys is correct. He would in this case be asked to determine from evidence submitted from the surveyor who is making the survey, how many block corners are to be established. I think it is quite correct to say that the Department should determine how many block

corners should be included. They have the surveyor's evidence as to accuracy of these corners, and surely they are in a position after getting the evidence of the surveyor to say how many block corners shall be included and form part of the Municipal Survey.

Mr. Reuben—I take it the surveyor would go out and make a survey and bring in a report, and after he looks over his field notes he would perhaps have to go back and establish these points.

Mr. Rorke—The Department is always open after instructions are issued to the surveyors; the surveyor is working with the Department under their instructions, and it is within their rights to write the Department and ask what should be done in the case.

The Chairman—Amend them in such a way as to comply with instructions.

Mr. Rorke—Yes. I think unless the points are confirmed a surveyor would not be in a position to plant a monument.

The Secretary—He should remove them if they are wrong.

The Chairman—The report is broad enough; it lays down some principles of legislation and infers it would be a matter of negotiations to get legislation into shape and to get legislation through the Legislature. The adoption of the report, I presume, in its present shape, would leave the details open to further consideration by the Legislation Committee.

The Secretary—It is suggested I should add to my motion for adoption of this report that instructions be given to the Secretary to do what can be done to secure the embodiment of the amendments, suggested by Mr. Roger Lee, in the Survey Act. If the seconder will agree to that I will amend my motion.

The Chairman—Is that agreeable to you, Mr. Bolton?

Mr. Bolton—Yes.

Mr. Rorke—I would suggest, Mr. Chairman—it is a matter of legislation—that it would be wise for the Legislative Committee to have an interview with the Minister and show reasons why this is asked for. I think an interview would go a good way towards securing necessary legislation.

The Chairman—I think that is in the inference in the motion as now put by Mr. leMay. The motion is to adopt the report coupled with instructions to the Secretary to take up the matter of having the amendment brought into effect, and it is to be inferred that will include consultation with the Minister. If there is no further discussion, I will put the motion. All in favor. Carried.

REPORT OF COMMITTEE ON ENTERTAINMENT

Your Committee begs to report as follows:—

This year the duties of your Committee were enlarged by invitation having been extended to the ladies to take part in certain of the functions in connection with the Annual Meeting. At a meeting of the members of the Association resident in Toronto, it was decided to circularize the Toronto members in order to raise funds for the entertainment of visiting members and their ladies. The sum of two hundred and thirty dollars was raised in this manner. This liberal response was very much appreciated by your Committee.

On Tuesday evening, February 19th, a reception was held at the Engineers' Club, the President and Mrs. Routly receiving the guests. The reception was followed by an illustrated lecture by Dr. Coleman.

The annual dinner was held on Wednesday evening, February 20th, at the Engineers' Club, the President, Mr. H. T. Routly, occupying the chair, and Mr. W. G. McGeorge the vice-chair. The attendance at this function, including the guests, was seventy-seven.

Toast List.

"The King"—Proposed by the President.

"The Empire and Canada"—Proposed by the Hon. Frank Oliver, responded to by the Hon. Chas. McCrea.

"Ontario"—Proposed by Mr. G. H. Mountain, responded to by the Hon. James Lyon.

"Sister Societies"—Proposed by Mr. J. S. Dobie, responded to by Mr. Frank Ewart, Professional Engineer; Mr. F. V. Seibert, Dominion Land Surveyor; Mr. Balmer Neilly, Engineers' Club; Mr. P. O. Wynne-Roberts, Engineering Institute of Canada.

"O.L.S. Veterans"—Proposed by Mr. N. B. McRostie, responded to by Mr. Willis Chipman.

"Our Guests"—Proposed by Mr. Fraser Aylsworth, responded to by Mr. G. F. Henderson, K.C.; Dr. J. S. Bach.

The Toronto ladies entertained the visiting ladies at a dinner held at the Prince George Hotel, on Wednesday evening, following an afternoon spent at the Ontario Museum. The dinner was followed by a theatre party at the Princess Theatre. These functions were presided over by Mrs. Routly, assisted by the Committee of Toronto ladies.

The usual Veteran's luncheon was held on Thursday, the 21st at the Engineers' Club. This luncheon is due entirely to the efforts of Mr. Willis Chipman, and was the usual success. Mr. Chipman is to be congratulated on the able manner in which this luncheon was conducted.

Your Committee wish to thank all those who assisted in making this annual meeting a success—particularly the Engineers' Club—for extending the privileges of temporary membership, to all members attending the Association meeting.

The Financial Statement is as follows:—

RECEIPTS:

Donations by City members	\$230.00
Tickets for dinner (65 at \$2.00) ..	130.00
Ladies' dinner	25.00
Ladies' theatre tickets	24.00
Surplus from 1923	8.45
	<hr/>
	\$417.45

EXPENDITURES:

Reception—Tuesday	\$ 89.00
O. L. S. dinner—Wednesday	231.40
O. L. S. ladies' dinner and theatre	73.95
Circular letters, \$3.65; postage,	
\$2.80	6.45
Dominion Regalia Co.	7.20
Luncheons, etc.	9.05
Balance on hand40
	<hr/>
	\$417.45

Respectfully submitted,

JOHN vanNOSTRAND,
Chairman.

REPORT OF COMMITTEE ON TOPOGRAPHICAL AND EXPLORATION SURVEYS

Mr. President and Gentlemen:

In a report to the Committee of the Board of Surveys and Maps, to co-ordinate the activities of the United States Government, is found the following statement: "The demand for topographical surveys has increased from year to year, as their value to engineering and other activities is recognized, until there are now on file, urgent requests for surveys where execution would entail an expenditure of \$14,000,000. It has been proposed by this Committee that the Topographical Map of the United States be completed within the next twenty years and that the estimated expenditure will be \$40,000,000."

Turning now to other countries, it is found that the British Isles have been entirely surveyed and the authorized normal programme of work of the ordinance survey of the United Kingdom includes the revision of certain topographical maps at periods respectively of fifteen years, twenty years and forty years. The Army Topographical Service of France proposes to execute a completely original and modern map of France. The field information for this map is collected on a scale of 1-10,000, so that maps on scale of 1-20,000 and 1-50,000 can be published concurrently. Elsewhere in Europe and throughout the world, though notably through British possessions, extensive topographical surveys are being carried on. In South Africa, the trigonometrical survey which has hitherto been under the direction of His Majesty's Astronomer at the Cape, is now carried on by the Director of Trigonometrical Surveys at the head of the South African Survey Department. In a report of their field operations of last year, it may be noted that seventeen surveyors were employed in charge of parties operating through Cape of Good Hope, Transvaal, Orange Free State and Natal.

Topographical Surveys in Canada

Canada is not behind other countries in recognizing the importance of topographical maps, though on account of our comparative youthfulness and vast extent, together with the rapidity with which enormous areas have been developed, the

greater part of our surveying up to the present has consisted in marking out lands for occupation. So far it has not been possible to devote as much attention to topographical work as has been done in older and more compactly settled countries, though the demand for this class of maps in this country is just as insistent as elsewhere. Now that our surveys are well in advance of the immediate needs of settlement, topographical and exploration surveys are receiving more attention, and it is probable that the next few years will see an extensive addition to our already important contribution to these maps.

Three Federal departments have been for a number of years engaged in making topographical maps with three different objects in view. The Dominion Government, realizing the need of co-ordinating this work in order to secure the greatest measure of economy and efficiency, formed in 1922, the Board of Topographical Surveys and Maps.

The three departments and their fields of operations are as follows: The Department of National Defence has in mind the making of maps for militia purposes; it began the surveys for the series, generally known as "Militia Maps," in 1903. This series now covers approximately 40,000 square miles, mostly in the Provinces of Ontario and Quebec. The Geological Survey of the Department of Mines has in view the use of maps for geological purposes, and commenced making their maps in 1909; they have covered about 35,000 square miles throughout various parts of the Dominion. In 1887 the Topographical Survey commenced the photo-topographic survey in the Rocky Mountains, which has been continued with interruptions to the present time. This survey now covers about 13,000 square miles, and is confined for the most part to Dominion parks and forest reserves. It may be noted here that Canada leads the world in photo-topographical surveys. While various attempts have been made to adapt this type of survey to requirements elsewhere, they have not met with the success that has attended our surveys in the Rocky Mountains. It is of interest now to note that some of our surveyors who have been trained in this type of survey in Canada, are now engaged in directing similar surveys in other countries, one being now in the region of Mount Everest in India.

In addition to this survey the Topographical Survey has for years issued three-mile sectional sheets which cover a large part of the Western Provinces. In 1919 it was decided to add

complete topographical information to this series, and up to the present time about 90,000 square miles have been surveyed. In 1923 the operations of this survey were still further extended, and preliminary surveys were commenced in the Provinces of Nova Scotia and New Brunswick in order to complete one-mile maps to the standard of the militia maps. In this the Topographical Survey is co-operating with the Department of Militia and Defence, while the Geodetic Survey supply the necessary trigonometric and precise level control.

Method of Numbering Maps

One of the first results of the formation of the Board of Topographical Surveys and Maps has been the adoption of a scheme for numbering map sheets that is applicable throughout Canada and fits in with the International series of maps. In this, the original unit is 6° in longitude by 4° in latitude, and these are numbered consecutively over the country. Each of these large units is broken into 24 degree sheets which are distinguished by the letters A to X. Each degree sheet is broken into eight smaller sheets, each 30 ft. in longitude by 15 ft. in latitude, which are distinguished by Roman numerals from I. to VIII. For example, Sussex Sheet in New Brunswick is numbered 22-L-VI and a permanent post planted in that sheet is marked with the sheet number in addition to its consecutive post number.

Exploratory surveys, base and meridian surveys, traverses of lakes and rivers, triangulation surveys, lines of levels, aerial photography, land classification, the adaption of the radio to surveys, and the use of new instruments are all matters contributory to topographical mapping, and while important developments and progress have been made during the past year in all these details, it is only possible here to refer to some of the more outstanding features.

Northern Exploration

The Government steamer "Arctic," under the command of Captain J. E. Bernier, again made a trip to the Canadian Arctic Archipelago; a detachment of Royal Canadian Mounted Police was installed at Pangnirtung on Cumberland Sound, Baffin Island; relief police parties and supplies were landed at Craig Harbour and Pond's Inlet; while many surveys were made of police grounds by a land surveyor who accompanied the party. One of these surveys was at Craig Harbour, where a lot was laid out for the use of the police in latitude 70° deg.

10 ft. This is certainly the farthest north land survey in America, and it is probably the farthest north in the world. By the use of radio, time signals were received throughout the cruise. It might be mentioned here that due to the proximity of the magnetic pole in Boothia peninsula, the magnetic declination at times exceeded 100 degrees so that the compass pointed south of west rather than north.

In Western Canada the Mackenzie River traverse was completed through to the Arctic Ocean, the traverse of Great Bear Lake was commenced, while work on Great Slave Lake was continued on the north arm. Similar traverse work was carried on in the mineralized district north of the Pas.

Ontario Surveys

In Ontario a creditable amount of traverse work has been done of rivers and lakes in Northern Ontario. The traverse of the English River below Lac Seul was continued; another party followed the Moose River down to Moose Factory; while farther traverses were made on the Kabnikagami and Seine Rivers and of Lac des Mille Lac, Big Sandy Lake and Rainy Lake. Township outlines were extended through a part of the Mississauga Forest Reserve, in the District of Sault Ste. Marie, in the Cochrane District, in the vicinity of Abitibi and Matagami Rivers, and also in the Algoma District. Base and meridian work was carried on west of Nipigon Lake in Thunder Bay District.

Control Survey Operations

Geodetic surveys and precise traverses have kept pace with requirements. One of their operations of last year is novel and is of interest to Ontario Land Surveyors. During the winter of 1922-23, a line of precise levels was carried over the ice on the English River from Sioux Lookout to the confluence with the Winnipeg River, and starting from Kenora, a line was carried down Winnipeg River, past the Ontario-Manitoba Boundary to Lake Winnipeg. In all, some 450 miles of levels were run, while the accuracy compared with that obtained during summer levels along railways. This work was primarily to afford control and to co-ordinate isolated water power surveys of the Dominion Water Power Branch.

Aerial Photography

Aerial photography is divided into two divisions, vertical photographs and oblique photographs.

Up to the present, vertical photographs have been more popular and are, on account of the ease with which maps are compiled, now being successfully used by several commercial organizations in Canada and by the Air Board of Canada in co-ordination with topographical surveys. The operation of the Air Board during the past year included a strip of photographs along the Ontario-Manitoba Boundary, the photographing of the Cooking Lake forest reserve near Edmonton, and photographs of a portion of the New Glasgow Sheet in Nova Scotia, which is now being surveyed.

The Provincial Forestry Branch of the Province of Ontario carried out a notable forest survey in the district north of the Transcontinental Railway, from the Quebec boundary westward to Moose and Mattagami Rivers, including their west banks to a depth of five miles, by means of observations from aeroplane and ground parties. Briefly stated, the different forest types and outstanding topographical features were sketched from the air on the best available maps of the district. The ground parties examined in detail characteristic timber stands; from this a comprehensive estimate of the forest resources and a map of forest types is being made. The area involved is over 13,000 square miles, on which 342 flying hours were supplied by the Laurentide Air Service.

A feature of aerial mapping which needs only to be mentioned to be appreciated, is the opportunity it affords to decide on the location and to quickly purchase the right-of-way of a contemplated transmission line, highway or railroad, before the interested landowners have an opportunity to combine in demanding prohibitive prices.

Oblique photography has been investigated further and experimented with more fully in Canada than anywhere else on earth. While these photographs do not permit of the infinite detail that is possible from vertical photographs, this loss is more than offset by the increased area covered, so that in moderately level country it is possible to state that accurate horizontal maps of large areas may be prepared more economically from the reduction of oblique photographs than is possible from verticals. Last season aerial photographs of this nature were taken by the Air Board of Canada in the vicinity of Red Deer, Alberta, St. John, New Brunswick, and in connection with exploratory and control traverses in the vicinity of Churchill River.

New Instruments

As was forecast in this report a year ago, radio has proven its usefulness in enabling surveyors out of reach of telegraph to obtain time signals. It was used by them on the Mackenzie River, on surveys in the Arctic Archipelago, and on an exploration into the barren lands. By means of the radio and an ordinary surveyors' transit, it is now possible to determine position within 10 seconds of either latitude or longitude.

The use of the range finder was referred to last year as a more convenient method of obtaining distance than either by stadia or micrometer. This instrument now has an accepted place on certain types of traverse work. Another instrument, which is not generally known, but in which there are great possibilities to the topographer, is a direct reading tachometer that has been developed by Messrs. Cooke, Troughton & Sims, Ltd. This consists of a simple arrangement of cams by which the spacing of the stadia wires is controlled in accordance with the vertical angle of the line of sight, so that no matter what the inclination may be, the stadia intercept on the rod multiplied by 100 gives the reduced horizontal distance, without further reduction or calculation. Similarly, another stadia intercept multiplied by 10 gives the vertical height.

References—Aerial Photography

"Aircraft Proves a Great Aid in Survey Work," *Natural Resources Bulletin*, Department of Interior, January, 1924.

"Aerial Survey of James Bay Region Proves Valuable," *Canadian Forest and Outdoor Magazine*, November, 1923.

"Practical Application of Aircraft to Surveying," *Journal of the Dominion Land Surveyors' Association*, January, 1924.

"Exploration and Surveys in Canada's Arctic Archipelago," two articles in *Natural Resources Bulletin*, Department of Interior, November, 1923.

"Surveys in the Far North," *Journal of Dominion Land Surveyors' Association*, January, 1924.

"The Range Finder on Surveys," *Journal of Dominion Land Surveyors' Association*, April, 1923.

"Time Saving Instruments"; "A Direct Reading Tachometer," *The South African Survey Journal*, December, 1923.

"Winter Observing on Precise Levelling," Journal of Dominion Land Surveyors' Association, October, 1923.

J. W. PIERCE, Chairman.

The Chairman—Do any members want to ask Mr. Pierce any questions regarding the paper or offer any comment?

Mr. McRostie—I would like to ask Mr. Pierce what method they use to join the photographic surveys together.

Mr. Pierce—Well, it is absolutely necessary to have ground control. In these oblique pictures that is the point that raises the most trouble. It is necessary there to have two points that can be known and identified on the photograph. There are several other combinations of things that can be used. These are what are usually regarded as essential. From this it is possible to determine the elevation of the aeroplane at the time the picture was taken, and they have prepared in the office in which they work a series of charts that are worked out—I think it is twenty-five feet in elevation, and these are shown on the photograph, and you have your paper alongside the photograph, and it is merely a matter of transferring the features on the graph from the paper. There is always a certain degree of inaccuracy in transferring these, depending on how close the celluloid, as shown there on that picture, agrees with the latitude of the plant. As the work is carried on I suppose they will get out these graphs in ten-foot lengths, but now they are only working with routine maps for some of the topographical work.

REPORT OF COMMITTEE ON RE-SURVEYS

At a meeting held on Tuesday, February 19th, which was attended by G. A. McCubbin, F. F. Miller, S. B. Cole, J. J. Newman, N. B. MacRostie, H. L. Esten, J. W. Tyrrell and Willis Chipman, the following resolution was submitted and unanimously adopted:

That this Committee believes that a re-survey of the older parts of the Province is desirable and that the Legislative Committee be asked to make the following recommendation to the Government:

“That Sub-section 1 of Section 17 of the Surveys Act be amended by adding the following: ‘The Inspector of Registry Offices shall be empowered, where he deems it necessary, to require the Municipal Council of any Municipality to have prepared a plan, based on actual survey, of the whole or any part of such Municipality, and to have planted durable monuments at governing points.’ ”

WILLIS CHIPMAN, Chairman.

Feb. 19th, 1924.

REPORT OF COMMITTEE ON TOWN PLANNING

Mr. Chairman and Gentlemen:

During the past year the activities of the Federal Government have been formally limited in town planning to the development of national parks and park properties.

And generally throughout the Provinces there has been comparatively little activity in town planning either educational or constructional. The reason, or the excuse given, is the general business depression and that there is but little new development.

But your Committee is by no means downhearted. Mr. H. T. Routly, O.L.S., our President, and a valued member of this Committee, has pointed the parallel cases of highway and town planning development. The former, now firmly established, claims many Ontario Land Surveyors among its Engineers. With the same attitude towards town planning, which is coming just as surely as highway development was to come, Ontario Land Surveyors should be prominent in town planning.

Some proof of the belief of your Committee in the future of town planning and the relation of the Ontario Land Surveyor thereto, is afforded by the cases of the City of Kitchener and the Town of Waterloo. These two adjoining municipalities have been actively engaged in planning work during the past year. On the staff of the City Engineer of Kitchener, Mr. P. J. McGarry, O.L.S., has been engaged in permanently staking block corners and in compiling a base map of the city, while Mr. G. C. Hagedorn, O.L.S., has been engaged in contour surveys related to bench marks established by the Geodetic Survey of Canada. In the work of town planning, the Chairman of this Committee is engaged in a consulting capacity by both Kitchener and Waterloo. Final plans and by-laws are expected to be ready early this spring.

The Toronto Branch of the Town Planning Institute of Canada has been particularly active this season under the Chairmanship of Mr. N. D. Wilson, O.L.S., and with the aid of our popular Secretary and a member of this Committee, Mr. T. D. leMay, O.L.S. Members recently admitted to full membership are Mr. T. B. Speight and Colonel A. J. vanNos-

trand, Ontario Land Surveyors. It is expected that the next annual meeting of the Institute will be held in Toronto in April. Your Committee urges all members of this Association to take full advantage of this important town planning event, further details of which will no doubt be given at a later date.

Your Committee is generally of the opinion that town planning can be best advanced not by trying to force it on all municipalities, but by encouraging those municipalities in which some interest is evidenced.

We are glad to report all members but one of the Town Planning Committee present at this meeting.

HORACE L. SEYMOUR, Chairman.

REPORT OF COMMITTEE ON REPOSITORY

To the President and Members of the Association of Ontario Land Surveyors.

Gentlemen:—

Your Committee on Repository for the year 1923-4 begs leave to report as follows:—

During the year the books and pamphlets belonging to the Association, in the Library of the Engineers' Club, have been carefully gone over by your committee, when a number of the latter, being out of date, were discarded as useless.

The unbound pamphlets remaining consist of a number of Public Archives Reports, Public Works Reports, Bureau of Mines Reports, Quebec Surveyors' Annual Reports, American Water Works Association Reports and some Engineering Societies' Reports and Geological Survey Reports, a number of the last two being bound. Your Committee thought it would be better to have the opinion of the Association as to what should be done about these books; considering that they should either be bound or else discarded.

A considerable time has elapsed since a volume of our Association Reports has been bound. We would recommend that this be done in the near future. A number of quite ancient books are among our collection and your Committee would suggest that a better place for these would be with the old instruments, mentioned in last year's report, when the latter are placed with the Provincial Archivist, as suggested.

Some photographs, at present in one of the drawers under the bookcases, might be of interest to the Biographical Committee.

There are still on deposit in the basement of the Parliament Buildings annual reports covering the following years:—1887, 1888, 1889, 1895, 1898, 1900, 1902, 1903, 1904, 1905, 1907, 1913, 1914, 1915 to 1923 inclusive.

Respectfully submitted,

H. L. ESTEN,
Chairman.

REPORT OF COMMITTEE ON BIOGRAPHY

Four meetings of the Committee were held since the Annual Meeting of the Association in February, 1923, all of which were well attended. It is a great pleasure indeed to report that harmony and good fellowship always prevail at our meetings.

This year we present for publication the following biographical sketches:

No.	Name.	Date of Birth	Date Qualified	Date of Death
1.	Theodore de Pencier	1750	1789	1817
2.	Aaron Greeley	1773	1797	1820
3.	Lewis Burwell	1794	1818	1865
4.	John Blakely	1796	1830	1853
5.	John Emerson	1799	1833	1884
6.	Arthur Rankin	1816	1836	1893
7.	Humphrey Young	1819	1840	1845
8.	Cyrus Carroll	1834	1860	1923
9.	C. C. Forneri	1842	1864	1887
10.	Thos. W. Dyas	1845	1865	1899
11.	Wm. G. McGeorge	1839	1866	1906
12.	Otto J. Klotz	1852	1876	1923
13.	Hargreaves Kippax	1845	1877	1922
14.	Chas. A. Bigger	1853	1882	1923
15.	David A. Niven	1873	1913	1923
16.	Louis A. Kinnear	1889	1913	1923
17.	George L. Rainboth	1884	1913	1923

We are taking the liberty of requesting that a portrait of Luke de Pencier, son of Theodore, be published, as he is the antecedent of many descendants of the name now residing in Canada, and he was also a pioneer in this Province. His farm is now owned by one of his grandchildren. No portrait could be obtained of James Blakely or of Aaron Greeley.

We confidently believe that the perusal of these sketches will be found not only of interest to the members, but that they will serve as an inspiration to all Surveyors.

The Veterans lost their senior member by the death of Mr. Cyrus Carroll in December last. The majority of the fourteen surviving Veterans are enjoying their normal good health. Mr. George Gibson, now the senior Veteran, wrote on February 8th regretting that he could not attend the Luncheon, stating that "the spirit was willing but the flesh weak."

The reminiscences of Mr. Henry J. Cambie that appeared in McLean's Magazine in December and January are of value and interest to Surveyors as well as Engineers.

The different attitudes of the descendants of deceased Surveyors when approached for information for biographical sketches, would furnish material for an interesting chapter in psychology. The majority welcome the opportunity to do honor to their ancestors, but some are indifferent, and a few appear to resent what they consider as an intrusion on their private affairs.

The halos that are painted by some of the descendants may be overdrawn in some instances, but this is certainly more commendable than indifference or neglect.

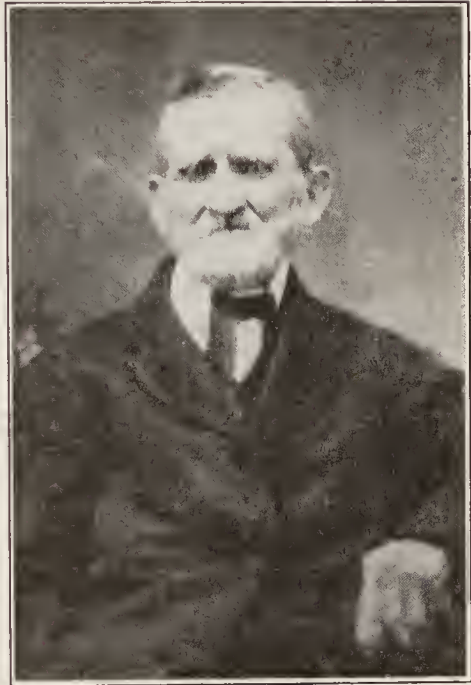
Some of our pioneer Surveyors appear to have left no records, but some day a descendant may be discovered, or such descendant may discover our Association. In our Report for 1920, pages 87 and 88, is given a list of fourteen pioneers of whom we then had no portraits or proper sketches. We have prepared sketches of three of these since that date—Augustus Jones, Charles Rankin, and William Hawkins. Of the others, we should eventually succeed in securing the information necessary respecting Alex. Aitken of Kingston, Abraham Iredell, Publius V. Ellmore of Belleville, Lewis Grant of Grenville, and William Hambly, as they were prominent men in this Province for many years. Patrick McNiff of Williamsburg, Niagara and Detroit, was a trusted Surveyor when this Province was organized and for some years afterwards, but to date none of his descendants have been discovered.

We desire to express our appreciation of the assistance received by the Committee from time to time from many members of the Association.

WILLIS CHIPMAN, Chairman.

THEODORE de PENCIER

In the seventeenth century Theodore Christian Von Pencier came from Sweden as tutor to one of the Dukes of Brunswick. From him descended the subject of this sketch. He was born in 1750, and was probably a soldier from his earliest manhood, as he was a Captain in Baron de Riedesel's Dragoons that came to America with other German mercenaries to the assistance of Great Britain in the Revolutionary War. He landed at Quebec in June, 1776, with his regiment, and was attached to General Burgoyne's Army. At the Battle of Saratogo in 1777, Riedesel's Dragoons and other Hessian troops surrendered to the Americans. Riedesel was exchanged in 1779 and afterwards served on Long Island with the British.



In due course dePencier was returned to England, where he asked for and received an honorable discharge after the war was over. He then went to Germany, but only remained a short time, as he returned to Canada in the autumn of 1784.

The date of birth of Capt. de Pencier is not now known. He was married on or before 1784, as he mentions that he was granted rations for his family by Brigadier-General Hope.

He took up his residence in the Seigniory of Sorel at the mouth of the River Richelieu, where Mr. Robert Jones was then the administrator, and appears to have lived there during his entire lifetime.

Upon his return to Canada he was granted ten guineas by Governor Haldimand and three hundred measures (acres?)

of land. Not having sufficient resources to clear the land, and being then untrained for bush life, he did not take possession of the land offered. He acknowledges that he was "too awkward to devote himself to business or too proud to learn to sell at a great price that which had cost but a trifle," also that hands "accustomed only to the use of the sword and the training of horses, were too weak to cut down trees and to sell them at a profit quickly and advantageously." He was further granted six months' rations for himself and family, with twenty Louis. With no employment to hope for, he decided to take up land surveying, for which his studies in mathematics had made him familiar.

His reason for taking up Land Surveying as a profession he gave in a petition dated Nov. 15th, 1817, to Governor-General Sherbrooke, as follows:—

"May one dare to depict to your Excellency the motive that induced to a proceeding so rash (on the part of a person) having little money (and) no protector? A basis of honesty and the high opinion formed of the English lofty mindedness were the chief motives; and once having experienced the happiness of the people living under your laws inspired the desire to live henceforth and to die under their benign influence. It was not without great sacrifices that your petitioner was able to carry out such a plan. There was the open prospect of a fortune within his reach in military affairs, for which the education of your petitioner was calculated, and which was rendered probably certain by the long service to the Ducal house of a father grown white under arms in the most distinguished ranks and who had poured out his blood for the English cause at the battle of Bergen, where he was wounded."

He obtained employment under William Chewett when the latter was placed in charge of Surveys in the Lunenburg District in 1786, but it was not until February 27th, 1789, that de Pencier received his commission as a Deputy Surveyor.

For his services as chain bearer from October, 1787, to April, 1788, he was paid at the rate of one shilling and sixpence per day for 162 days.

In 1791 he was instructed to survey the River Rideau from the Forks about two miles below Kemptville for a distance of nine miles up stream. On August 19th, 1791, he commenced the survey of the Township of Marlborough on the north side

of the Rideau, and completed his work on August 31st. In this time he ran the boundaries of Marlborough and the first two concession lines, numbering the lots from the eastward. His assistant was John Stegmann, another German officer in the late war. There was a tradition among the old settlers in Marlborough that de Pencier was to have surveyed a range of townships along each side of the Rideau, and as he did not return after his surveys, they assumed for some time afterwards that he had died. He selected lot 18, concession 1, for himself, made a small clearing, and erected a shanty thereon. He also obtained a certificate for the lot and the broken front between it and the river, containing in all about 230 acres, and presented the certificate to Richard Duncan, President of the Lunenburg Land Board, who transferred it to his successor, John Munro. His application for the land was revived in 1815, and eventually the patent was issued and his son, Luke, took possession. In this same year he made a survey in the seigniori of Chateauguy.

The following from his journal is of interest:

"Sunday, Aug. 31st, 1791. We took the precaution this forenoon to bring with us a bottle holding five gallons to assist us in our work, which was commenced, and which being finished, we reckoned the distance to the boundary line, as was accustomed to be done."

In the Ontario Archives Report of 1905 will be found several references to Theo. de Pencier and his work as a Surveyor. The instructions for survey of Marlborough are given in full, and several interesting letters.

The instructions from the Surveyor-General were supplemented by brief instructions from the Land Board, signed by John Munro, Malcolm McMartin, and Richard Duncan. .

On Aug. 13th, 1791, he wrote John Collins from Oswegatchie stating that he had left there on Aug. 1st, arrived in Montreal Aug. 3rd, left Montreal Aug. 6th, arriving at Oswegatchie Aug. 12th, and that he would enter the woods tomorrow. In this letter he registers a complaint against the method of surveying concession lines in the seigniories, then being followed by John Stegman, and describes the correct method. This letter was in French. The Surveyor-General's Department acknowledged this letter briefly.

It would appear that the Department considered that de Pencier's expense accounts were too high, as he had charged

£5 per barrel for pork, for which other surveyors charged £4, and there were claims of overcharges for time.

There can be little doubt that he exercised more care in his work than some of the other surveyors of the time, and owing to disputes that arose over his accounts, he became involved in litigation that impoverished him.

Between 1792 and 1795 he made a survey for the military authorities of a tract of land on St. Joseph's Island, Lake Huron, which caused him much future annoyance and trouble. A balance remained unpaid, which he was directed to attach to his account for the St. Francis survey by Governor Prescott, but when presented it was referred to the Military Department, but never paid.

He made a plan of the strait and fall of St. Mary's River under direction of Lieut. Brice of the Royal Engineers.

During the regime of General Robert Prescott, 1796-1799, de Pencier was commissioned to perform a critical survey on the St. Francis River. The Indians made claims which had been made under the French rule, but never settled. Owing to the difficulty in securing evidence, and the wrangling of the parties interested, he twice asked to be released from the work, but at last completed it. Boundaries were set and the survey approved, and an order for payment amounting to over four hundred Louis was issued. This did not, however, cover the cost of plans and books of field notes.

For about ten years de Pencier was employed by the Government to perform surveys, but it would appear from his reports and petitions that his statements of accounts were disputed and that he could obtain no satisfaction from the Deputy Surveyor General, Collins.

It is quite possible that his accounts were considered extravagant, as he had been an officer in the army for many years and may not have had the necessary practical experience in the bush to enable him to prosecute surveys as cheaply as some of the more experienced surveyors of the day.

He had made surveys in Mariborough, on the St. Francis River, and on St. Joseph's Island, Lake Huron, which payments were due.

Secretary Green was a "man of honor" but "arbitrary." The surveyor's claims were disputed and his appeals remained

unanswered. He was driven to despair and growing desperate under the act of oppression, he bombarded with pamphlets those whom he thought able to procure him an audience. Bishop Jacob Mountain eventually succeeded in inducing the Legislative Council to appoint a committee to consider his claims and found £45 due the petitioner. The seventeen Louis balance on St. Joseph survey was not alluded to, but it was referred to the Military Department, who rejected it, saying it belonged to the contingent expenses. De Pencier appealed for a review of the matter, which was met by a peremptory refusal. He was again in despair, and his condition bordered on insanity. Without means to plead his cause in court, he secured a private audience with General Alfred Clarke, with the result that his claims were allowed, as he states, "to the last sous."

Owing to delays in payments, and to his expenses incurred at the capital, the small fund was so diminished that he received but little. "He, the falsifier, kept his position and died with all his honors, and the poor accuser was abandoned to his fate." So wrote de Pencier.

As his residence was at Sorel, and as he spoke the French language more fluently than English, his services as a Land Surveyor were frequently sought. He made seigneurial surveys for the people and occasionally for the Courts of Justice. He also surveyed 151 parcels of new lands for Mr. Jones, made reports upon 35 of them, and received payment for them at the usual price of one crown each.

Mr. Jones was succeeded by Mr. John K. Wells, whose policy was quite the opposite to that of Mr. Jones. He permitted surveys to be made by outside surveyors, and the reports in former surveys made by de Pencier were not asked for by Wells. De Pencier explained to Wells that it would be in the future interests of the seignury to call in the reports, issue the deeds for the lands and collect the costs of surveys made and for reports. Wells, however, was deaf to his entreaties. A long memorandum was then prepared by de Pencier and presented to Wells, but it would appear that he took no action thereon. "Pride took offense at the discovery of the smallness of his capacity in his administration of which the whole town is a witness. He avenges himself on the poor surveyor who, with a friendly intention, made it possible to

be useful, etc. Such a one shines in a low place, he becomes lost in a higher place."

"An ungrateful person is never just." So wrote de Pencier in a second petition to Governor Sherbrooke, dated Nov. 29th, 1817. He mentions making surveys for Mr. Nelson and Mr. Carter in the seigniority in 1804, this being the only date given. Although abstemious on principle and economical from necessity, he saw himself from day to day at the end of his resources and face to face with destitution.

From about 1799 to the close of his career he received no further instructions from the Government, owing no doubt to the litigation and troubles over former surveys.

He states in another petition, dated Nov. 15th, 1817, to General Sherbrooke, that he was at Quebec, when it was threatened by a French fleet under Admiral Richey, and volunteered for service, but Secretary Green received his offer in silence.

"The deepest wound which the heart of a soldier is able to receive recompensed his ambitious fidelity; not the least thanks to his good will were extended to him. He had nothing to lose, and if the fidelity which made him act had not been proof against everything, the resentment of such an affront would have been able to bring him to be false to his king, and to join a cause where he would have been received with open arms, and which would have preserved him henceforth from the humiliation which an adopted country heaped (on him)."

For fear of refusal he did not volunteer for service in 1813. "He saw medals of honor distributed to the young men around him, who had not even a smattering of tactics nor a theory of the art of war. They did their duty very well, but to prefer them to a trooper of nineteen years' apprenticeship seemed a paradox of precaution to your petitioner.

"Having enjoyed since infancy, and without interruption, the most enviable good fortune, and perfect health in a spare body, also nerves which not even fatigue had been able to bring to the point of bending before her, although exposed to the attacks of rheumatism contracted during the tardy, but fortunate, campaign of 1776, when the American fleet was sunk on Lake Champlain, and aggravated since in the survey of the River of Yamaska, of which the petitioners have since made the survey for twenty leagues from its mouth, in the last months of two consecutive winters. Scorning too much

these bodily pains, etc., this scorn later revenged itself with an irresistible force, for on the 22nd day of December, 1814, the career of your petitioner as a surveyor ended."

He became a recluse after 1814, and the title of the "Hermit of Sorel" was conferred on him by the people—a "fitting" title emblematic in miniature of Diogenes the Cynic.

His wife and two children resided with him from 1814 to 1817, and it was largely due to her industry that the family was supported. He states that he became "indifferent to all things, the objects that formerly stirred his sensibilities lost their power, the contemplation of great events exhibited on this globe for three years became his only study and drove weariness from leisure, otherwise unsupportable."

The two petitions to General Sherbrooke indicate that Capt. de Pencier was a man of scholarly attainments, highly sensitive, proud, but not a diplomat. For a few years after he qualified as a Deputy Surveyor, he was granted commissions for making surveys for the Surveyor-General. He became convinced that John Collins, the Deputy Surveyor-General, and Major Thos. A. Green, the Secretary, were not only withholding what was due him for surveys performed, but conspiring to defraud him. Appeals and delays reduced his finances, and the quarrel with his superiors deprived him of Government employment. He admits in one of his petitions that he was "peculiar in all his actions, in all his undertakings this bears the imprint of it and evident proof of this singularity." This was written in 1817, after three years of seclusion. He was ill, disappointed and impoverished, and it is possible that they should not be interpreted as a faithful description of the tragic events in his career. If his journals from 1785 to 1805 were available, they would probably throw many rays of sunshine on the two tragic petitions that are extant and from which we have quoted.

The date of his death is not known definitely, but it was probably in 1817.

Theodore de Pencier was twice married. The name of his first wife cannot now be ascertained.

There was one son, (1) Peter, by this wife.

His second wife was Dame Charlotte Bellefoil, by whom he had the following children:

(2) Luke, born 1785, died Nov., 1877. He was a Free Mason, and married Gertrude Onderkirk of Williamsburgh, Ont., who died in April, 1873, aged 79 years. They were both buried at Christ's Church Cemetery, Burritt's Rapids.

(3) Hortense, who married Shepherd of Sorel.

(4) Marie Josephine, who married Pierre Bellefeuville.

(5) Sophia, who married John Haines of Williamsburgh, "a dainty lady with golden locks."

(6) Another daughter, name now unknown, who married La Fontaine.

Luke de Pencier had five sons, as follows:

(1) William, 1811-1893. Married Amarilla Lane. Five sons and two daughters.

(2) Peter Theodore, 1812-1900. Married Sarah Eastman. Six sons and four daughters.

(3) Uriah, 1817-1866. Married Hannah Eastman. Three sons, Henry, Uriah Sidney and Theodore III., also six daughters. (Uriah Sidney only one now living).

(4) Louis, 1823-1893. Married Sarah McFadden. Two sons and three daughters.

(5) Isaac Walter, 1825-1912. Married Ann Carroll. Five sons and five daughters. He lived on the homestead in Marlborough.

Adam Uriah de Pencier, Bishop of New Westminster, B.C., is a son of Peter Theodore. Mrs. Frank K. Ebbitt, of Iroquois Falls, is a sister of the Bishop.

Percy de Pencier of Toronto is a son of Henry, and grandson of Uriah. Henry Percy de Pencier, Dome Mines, Limited, is a son of Henry and grandson of Uriah. He has two brothers and one sister.

Dr. Charles de Pencier of Montreal is a son of Uriah Sidney, and grandson of Uriah.

D. Brough de Pencier and T. F. of Toronto, and Harold, are sons of Theodore III. and grandsons of Uriah.

In 1857, Antoine de Pencier was established as a merchant tailor in Montreal. He may have been a son of Peter.

Mary, widow of Richard Goodwin of Spencerville, who now lives on the old homestead in Marlborough, and Rev. Charles

R., formerly rector of St. George's Church, Oshawa, are children of Isaac W. de Pencier.

The daughters of Luke de Pencier were as follows:

(1) Diana, 1815-1877. Married Elihu Adams. Seven children.

(2) Caroline, 1820-1890. Married Jeremiah Marcellus. Five children.

(3) Maria Sophia, 1829. Married George L. Burritt. Now living at Goderich. Four children.

(4) Eliza Ann, 1831-1912. Married Henry Moore. Five children.

(5) Julia, 1833-1912. Married Edward Burritt. Seven children.

The wife of Luke de Pencier was an ambitious, wise and courageous little woman. At the battle of Chrysler's Farm in 1813, she left two infants with friends and rode with the wives of other officers to witness the engagement, and when the enemy had retreated, she galloped her horse to headquarters over the dead and dying, to hear the roll call and assist in the care of the wounded.

Luke de Pencier received a pension for his services as a militiaman in the war of 1812-1814.

The portrait that accompanies this sketch is that of Luke de Pencier. No portrait could be discovered of Theodore de Pencier.

The greater part of the information for this sketch was contributed by Mrs. Mary de P. Goodwin of Kemptville, Ont., a great-granddaughter of Theodore de Pencier, to whom we are also indebted for the photograph. She resides on the Luke de Pencier homestead. The family changed the spelling of their name about one hundred years ago.

AARON GREELY

The Greely brothers came to America about 1650, one of whom, Benjamin, settled at Haverhill, Mass. His son, Captain Ezekial, lived at Hudson, N.H., also his grandson, Zacheus, Sen., who died at the age of 95. Zacheus, Jr., son of Zacheus, Sen., was the father of the noted journalist, Horace Greely of New York, 1811-1872. Two of Horace Greely's grand-uncles were killed at the battle of Bennington. Zacheus, Jr., lived at Amherst, N.H., only a few miles from Manchester, N.H., and not more than twenty-five miles from the birthplace of Aaron Greely.

There can be no doubt that Horace was closely related to Aaron, and may have been a nephew. It is not probable that he was a brother, as stated in a sketch now extant, as he was born in 1811, or thirty-eight years later.

Following the arrival of the United Empire Loyalists from the United States between 1784 and 1800, thousands of former citizens of the U.S. came to Canada. With some the motive was a preference for British institutions, with others cheaper and better land and a greater opportunity of acquiring a competence. One of these immigrants was Aaron Greely, Jr., son of Aaron Greely, Sen., of Hopkinton, N.H., a place near Concord. Aaron, Jr., was born there on April 25th, 1773. He was a school teacher, and his education qualified him for Land Surveying. He came to Upper Canada with his cousin, Zacheus Burnham of Cobourg, about 1795, and appears to have resided in the vicinity of what was known for many years as the "Carrying Place," near Brighton.

On November 18th, 1797, he was appointed a Deputy Surveyor. There may be a mistake in this date, as the Crown Lands records show that he surveyed part of the Township of Hamilton in 1791, parts of the Townships of Cramahe and Haldimand, and the Township of Percy in the year 1795. (It is more than probable that 1791 should be 1795).

There is a tradition in the family that he contracted with Lieutenant-Governor Simcoe in 1792 or 1793 to bring in thirty families and to erect two sawmills and two grist mills. He built one at Brighton (Presqisle) and one near Grafton in Haldimand. For these services he was to be granted all of the

balance of the land in Haldimand Township. It is further stated that Lieutenant-Governor Hunter, who succeeded Simcoe, refused to carry out the original agreement, but offered Greely 1,200 acres as compensation, which he indignantly refused and left the country in 1806.

On September 11th, 1803, he married Margaret Rogers, daughter of Col. James Rogers, of Fredericksburg. At the time she was keeping house for her brother, David McGregor Rogers, who was then living in the Township of Murray at the Carrying Place.

Greely had been negotiating for the position of Surveyor General in the State of Michigan, before Governor Hunter refused to carry out the terms of the agreement with Greely as the latter interpreted them. He decided therefore to leave Canada, and proceeded to Detroit, where he received the appointment of Surveyor General in 1811, after practising several years, part of the time probably as Deputy Surveyor General.

He did surveying work in the Saginaw district, also on the River aux Raisin, where the main road to Chicago entered the semi prairie country.

In the Autumn of 1806 his wife decided to go to Detroit with her only child, Susan. She had an open boat built at Presquise, with which she skirted the north shore of Lake Ontario. She was accompanied by her brother-in-law, Jonathan Greely, and Liberty White, the last being killed subsequently at a place upon which Chicago now stands. They skirted the north shore of Lake Ontario, got lost for a time in the Dundas Marsh, but eventually arrived at Queenston, where she sold the boat. The party was portaged around Niagara Falls to Chippawa, but they did not see the cataract. From Chippawa they secured passage on a vessel to Detroit, which was then a frontier village boasting of two brick dwellings and one stone council house.

Greely purchased a lot that extended to the river bank and erected a house thereon, in which they lived for five or six years. Two children were born there, Aaron and James.

On April 23rd, 1812, Congress confirmed claims as surveyed by Greely under directions of the Surveyor-General, making his survey authoritative. Greely was at Washington when war broke out. He left deeds of Michigan and other

valuable property at Buffalo, and then proceeded in a small boat towards Detroit, but was captured by the British at Malden. He escaped to Detroit, but when this post was captured by the British, on August 12th, 1812, Greely, who was then Commissary of the American Army, was made prisoner. Through the intercession of his wife he was paroled, and he and his family were sent to Buffalo, where they were living when the battle of Queenston Heights was fought. They afterwards undertook the journey from there to New Hampshire by the train of wagons which came up with supplies for General Hull's army. They passed through Geneva, Utica and Albany, and from there to Troy, and crossed the Hudson on the "Firefly," one of the earliest steamboats in America. The journey of 900 miles from Detroit to New Hampshire was safely concluded, and they settled down there, during the period of the war. Peace was declared on December 27th, 1814, and Mrs. Greely, who was then visiting an uncle in Vermont, remembered seeing the mail coach arrive on runners with the word "Peace" painted on each side in large white letters. Loyalty to Britain was too strong a passion with Mrs. Greely to be contented under any other flag, so she and her four children (another son having been added) started for Upper Canada in the Autumn of 1816. She arrived in Kingston via Sackett's Harbor, then went to Hallowell Mills on East Lake, where she stopped a few weeks. She then took up her abode at Grafton and lived there until 1821. She was preparing to go to Detroit when her husband's death occurred, but then decided to settle upon the land she had drawn from the Government in Haldimand, lot 2, 2nd concession. She also owned lot 1 in 3rd concession, and lot 1 in 4th concession. Mrs. Greely survived her three sons, and died at the ripe old age of 91 on August 22nd, 1866, and was buried in the Presbyterian Churchyard, Grafton.

Whether Greely returned to Canada between 1816 and 1820 is now unknown, but it is not probable. After the close of the war he went to Detroit for the purpose of attempting to realize on some of his property there, and probably resumed his practice as a Surveyor.

He died suddenly from fever at River Raisin, a few miles south of Detroit, on April 2nd, 1820, at the home of Mr. La Croix, and was buried there by his Indian helpers. The news of his death was conveyed by letter from Wm. Smith of Sand-

wich, to David McGregor Rogers, M.P., Bay of Quinte. This letter, dated June 7th, 1820, is the possession of Mrs. R. Z. Rogers of Grafton.

Aaron Greely and his wife had the following children:
Susannah Burnham, born Feb. 25th, 1806.

Aaron III, James Rogers and David McGregor Rogers.

They lived with their widowed mother and her daughter, Susannah, for some time:

It is reported that one or more of the sons sold Bibles throughout the district, this being before the B. & F. Bible Society began work in Upper Canada.

Mrs. Aaron Greely died at her home in Haldimand on August 22nd, 1866, aged 91 years.

Aaron Greely III. died August 27th, 1850, aged 42 years. He was unmarried.

James Rogers Greely, also unmarried, died June 26th, 1855, aged 45 years.

David McGregor Rogers was accidentally killed by a log rolling over him, and was buried three miles north of Colborne. He was married but had no children.

The daughter, Susannah Burnham Greely, remained on the homestead after her mother's death. When a young woman she taught public school, and in 1831 she taught at Colborne. Later in life she confined herself to Sunday School work, and continued as a teacher in Presbyterian Sunday Schools until within three years of her death, which occurred on Sept. 7th, 1904. She taught for eighty years, probably the oldest Sunday School teacher in the world.

A monument was erected to her memory by the Presbyterian Church to commemorate her work as a Sunday School teacher, and unveiled with appropriate ceremonies on Nov. 21st, 1907.

Mr. R. B. Rogers adds the following:

"Mrs. Aaron Greely ('Aunt Greeley') and Miss Greely ('Cousin Susan') were remarkable people and had extraordinary memories. I remember Mrs. Greely could recite the whole of Sir Walter Scott's 'Lady of the Lake' off by heart. Their visits to our home were always welcomed by us children, as they used to relate to us so many interesting stories of their experiences. I well remember Miss Greely telling me of

her experiences during the McKenzie rebellion, 1837, about moulding lead bullets and going from house to house with news or instructions. My recollection is that she was staying about Toronto, perhaps visiting with the Platers, who were related to us and are still in the vicinity of Toronto."

Mr. R. B. Rogers of Peterboro has also contributed the following information respecting the Rogers family:

Major Robert Rogers, of the "Rogers' Rangers," took an active part in the Seven Years' War. This regiment was revived during the Revolutionary War as the "Queen's Rangers." John Graves Simcoe (afterwards Lieutenant-Governor) commanded this regiment with distinction for some time during the war. The colors were presented to the Reference Library, Toronto, in February, 1924, through the generosity of Mr. F. B. Robins.

Major Robert Rogers, upon the fall of Quebec and Montreal, was charged with the command of the expedition which took over the command of the French ports from Montreal to Detroit in 1760 and thus terminated French rule in Canada. He remained in the West for some time as Governor of Macinac, and while there, in company with a trader named Henry, they purchased a large tract of land from the Indians for merchandise. He published several books descriptive of his expedition in 1760 through the upper lakes in open boats.

Major Robert Rogers died in England about 1800, after a chequered career in America. He was unmarried.

His brother, Col. James, commanded the "King's Rangers" in the Revolutionary War. The colors of this regiment were deposited at Governors Island, N.Y., about two years ago.

Col. James and his family were U.E. Loyalists, and settled in Fredericksburgh, C.W., about 1784. His second son, David McGregor Rogers, settled in the Township of Murray at or near the Carrying Place, where his sister, Margaret, who married Aaron Greely, was his housekeeper.

David McGregor Rogers (1772-1824) had two sons:

James G., 1804-1874, and Lt.-Col. Robert David, 1809-1885.

James G. had four sons: Col. Henry C., 1839-1915, Postmaster at Peterboro for thirty-five years; Dr. Edward J., of

Denver, died 1919; Charles, died 1875, and Col. Robert Zacheus, of Grafton, died 1911, aged 68 years.

Col. R Percy of Woodstock and Col. Hermon C. of Toronto are sons of Col. R. Z.

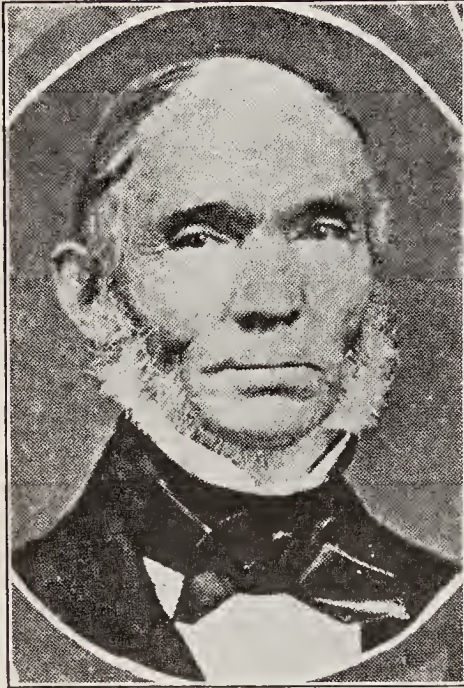
Lt.-Col. Robert David Rogers married Elizabeth Birdsall, daughter of Richard Birdsall, P.L.S., in 1840. They had the following sons: Col. Jas. Z., 1842-1909; George Charles, 1854-1883; Richard Birdsall, C.E., O.L.S., of Peterboro, born 1857; Edwin Robert, 1859-1917, and Alfred Burnham of Calgary, born 1864.

Richard B. has three sons and three daughters.

During the Rebellion, 1837, Lt.-Col. Robert D. Rogers was one of those who volunteered to cross the Niagara River from the shore at Chippawa to cut out the rebel supply steamer "Caroline" on Dec. 29th, 1837. The party commanded by Lt. Drew succeeded in capturing the steamer, and it drifted over the horseshoe cataract in flames. This brilliant achievement was accomplished without the loss of a man, but many had bullet holes in their clothing.

In 1856, at the age of 57, Lt.-Col. Robert D. organized a company and went to the front to repel the Fenian invaders.

LEWIS BURWELL



In the Report of Proceedings for the year 1909 will be found a biographical sketch of Col. Mahlon Burwell by the late Archibald Blue, with portrait. He was a prominent Land Surveyor and took an active interest in public affairs. Lewis Burwell was his younger brother.

The ancestors of these two men came to Virginia from Bedford and Northampton, England, about 1650. Some of the family were Loyalists during the Revolutionary War, and one James Burwell came to Upper Canada in 1796, receiving 200 acres of land for himself and each of his children in the Talbot settlement. Adam Burwell,

probably a relation of James, came to Upper Canada from New Jersey with his wife and family after the war, and settled in the Township of Bertie. It is reported that he had large possessions in New Jersey which were confiscated. Adam died at the home of his son, Mahlon, in 1828, at the age of seventy-nine years, and was buried beside the walls of the old English Church at St. Thomas.

Adam Burwell had three sons: Mahlon, Lewis and John.

Mahlon had the following children: Leonidas, Hercules, John, Brock, Hannibal and Edward, also one daughter, Mary, who married David McCormick of Pelee Island.

Mr. M. G. Burwell of Port Burwell is a son of Leonidas.

H. M. Burwell, O.L.S., of Vancouver, is a grandson of Mahlon Burwell.

There are also two grandsons in London, A. E. Burwell and Frank Burwell.

Mahlon Burwell died on January 25th, 1846, and was buried in the cemetery belonging to the church which he endowed at Port Talbot, about ten miles west of St. Thomas.

Lewis Burwell was born in February, 1794. He probably received his primary education in the schools of the district, and took up the study of Land Surveying with his brother, Mahlon. He qualified as a Deputy Surveyor on October 24th, 1818. He probably remained with his brother for a year or two, but began to practice at Brantford in 1820, his first work, according to his field notes, being surveys in the Townships of Burford, Dumfries, Oxford and N. Southwold.

The following is taken from the "History of the County of Brant," by F. Douglass Reville:—"It is popularly supposed that Lewis Burwell prepared the first survey of Brantford, but as a matter of fact there was a plan drawn up in 1824, and Burwell in a preliminary sketch dated October 22nd, 1829, then refers to it:

"First sketch of the Town of Brantford made for the purpose of obtaining the survey of the Great Grand River lands made up from observations taken at certain points and partly made from the plans made by Joseph Read in 1824."

Joseph Read was not a Deputy Provincial Land Surveyor, but was an assistant to Lewis Burwell. S. G. Read, of Brantford, is a brother. The plan referred to above was actually made by Samuel Read, father of Joseph, and S. G., who was a grammar school teacher.

Lewis Burwell sold his field notes to Quentin Johnstone, and from him they passed successively to John Fair, R. H. Squire, W. H. Fairchild, Jackson and Lee, and Lee and Nash, in whose possession they now are.

His notes were carefully entered and few surveyors to-day do as good work.

For the Provincial Government he made the following surveys:—

1831—Township of Luther.

1832—Township of Enniskillen.

1833—Town plot of Cayuga.

1834—N. W. boundary of Canada Co., Huron tract.

1834—Military Reserve, Burlington Heights.

1838—Lots 13 and 15, Village of St. Thomas.

1859—Lots in Town of Brantford.

1859—Lots in Town of Brantford.

1861—Line between 13th and 14th concession, Burford.

When asked for an explanation of the irregular Gores in Brantford, he is reported as replying that the place would never become more than a village in any event.

He was a man of quiet manner, retiring habits, and a Methodist in religion. He took no part in politics, although some said he was a contributor to a humorous, but short lived publication called "The Snapping Turtle, or the Grand River Roarer." He lived in a frame house on Darling Street, north side, between King and Market, this house being afterwards occupied by Dr. William Nichols.

C. C. Fairchild, Esq., O.L.S., Brantford, has contributed the following re Lewis Burwell and his family:—

There is a plan in the possession of the City Clerk here of Col. Talbot's estate, on which is endorsed: "This is my first attempt at map making," signed by Lewis Burwell, and dated June 16th, 1813. This was evidently made while he was a student.

In 1830 he signed as a witness to the original surrender deed of the site of Brantford by the Indians.

His first wife was a Miss Whitehead, by whom he had four children, one son and three daughters.

(1) Alexander B., who lived to manhood, but died unmarried about 1860.

(2) Sarah, who died young.

(3) Caroline, married Alfred Owen of Simcoe, and died there.

(4) Eliza, married Gilpin, and died in London.

I am unable to get dates and can find no record of any families from these unions.

There was an adopted daughter (5) Lucy, who was a school teacher in Brantford. She afterwards married George

Triggerson of Brantford, and had one son, who now lives in Winnipeg.

His second wife was a Mrs. Camp, whom he met while engaged on survey work at Stoney Creek.

Lewis Burwell was taken suddenly ill on the day the report of the assassination of Abraham Lincoln reached Brantford, and died suddenly, April 20th, 1865. He was buried in Burford beside his first wife, son and daughter.

The tombstone was found lying face downward amongst many more, and is in a good state of repair, but the grave, like most of the others in the cemetery, has fallen in and is overgrown with rank grass and weeds.

This tombstone, of white marble, is beautifully carved, but contains no reference to Mrs. Burwell or the son or daughter. The inscription reads:—"Lewis Burwell, died April 20th, 1865, aged 71 years and two months."

A verse from the New Testament at the bottom of the marble slab and a rather ornate leaf scroll around the top of the stone is all the record we have of one of Brant County's first and most notable surveyors. The grave, unkept and neglected, is a disgrace, and something should be done to repair it. The cemetery where the grave is, along with many more of our pioneers, is no longer used as a burial ground, and this accounts for its present condition.

JOHN BLAKELY

John Blakely was born in Scotland in 1796 and came to Canada when a young man. He settled on lot No. 1 in the sixth concession of the township of Bastard, County of Leeds, this lot being at the head of the mill pond on Mud Creek, west of Toledo. He married Mary Bovell. They had seven children as follows:—Hugh John, who moved to Minnesota; Franklin, who practised medicine at North Augusta; Robert, also a medical practitioner at Frankville, Ontario, who died at his father's home; Mrs. Crawford; Mrs. Robert Seymour; James; and Mary.

Mrs. Seymour had six children:—John, Mary, Lizzie, James, William and Gertrude.

Mary Blakely married Samuel Rabb, a school teacher, and afterwards a superintendent of public schools. He died in 1900, and his widow in August, 1922, aged 90 years.

Samuel Rabb had ten children. Two sons and two daughters died prior to 1922. Six children were living in 1922, one being Charlotte, who married George F. Gainford, now living at Athens. James Seymour also resides in Athens.

John Blakely took a great interest in military affairs. At the Battle of the Windmill at Prescott in 1838 he was on duty with two of his sons. A bullet passed through his son John's hat. It is reported that his sword was discovered at Prescott recently.

On July 23rd, 1830, Col. Blakely qualified as a Deputy Surveyor, and practised locally in Leeds and Grenville. He made one of the earliest, if not the earliest, survey in the village of Farmersville (now Athens).

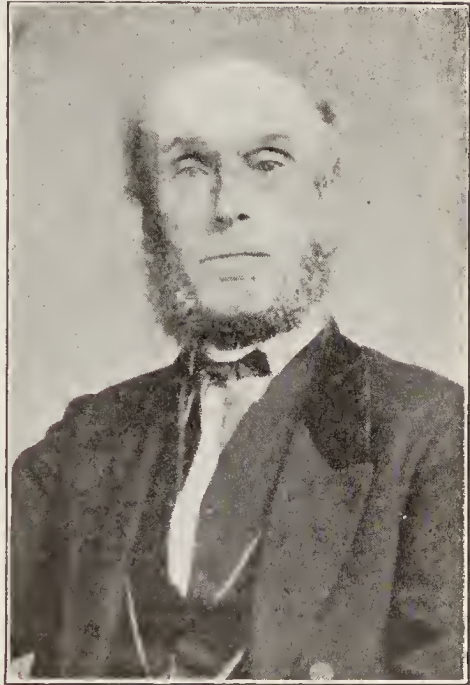
In 1838 he was instructed by the Provincial Government to Survey the Gores in the rear of the Townships of Augusta and of Oxford.

He always travelled on horseback, as did nearly everyone in those days. At his funeral, which was largely attended, one of the first buggies to be seen in that section of the country was driven by Abram Bell. It created about as much of a sensation as the first automobile less than twenty years back.

Lieutenant-Colonel John Blakely died at his home on July 10th, 1853, and was buried in the English Church Cemetery at Newboyne, where a monument was erected to his memory. No portrait could be obtained. He was a fine looking man, about the average height, with a military bearing, and was highly respected throughout the community.

JOHN EMERSON, P.L.S.**By C. Fraser Aylsworth, O.L.S.**

John Emerson, the father of the subject of this sketch, was born in August, 1772, and lived near Clones, in the County of Fermanagh, about forty miles from Dublin, in Ireland. He was an officer in the English militia in Ireland, and had a large landed estate, which he sub-rented. He was twice married, and by his first wife the following children were born near Clones: William, born 16th Dec., 1796; John, the subject of this sketch, born 16th Jan., 1799; Thomas, born 10th Feb., 1801; James, born 16th Oct., 1803; Anne (with whom the subject of this sketch always lived, and who married Robert Gil-



lespie), born 17th March, 1806; George, born 2nd April, 1808; Baptis, born 30th August, 1810, died 23rd August, 1813; Mary, born Oct. 20th, 1812, died January 28th, 1813. All those children living came to Canada, on different dates, about the year 1833. They settled on farms in the townships of Tyendinega and Thurlow, on the fine farming lands along the main travelled road leading from Roslin to Belleville. They were all fairly well educated, and William taught school sometimes. Thomas subsequently moved to Goderich, but all were buried in the Church of England cemetery at Roslin. The family were very religious, and strict Anglicans, although a memo., signed by their father in Ireland, reads: "Began my Christian course in December, 1798, and some time after joined the Methodist Society."

John Emerson, the subject of this sketch, received his early education near Clones, and at an early age learned surveying there, for which he had a natural talent. He came to Canada in the year 1832, and at first taught school. Then he articulated himself to Publius V. Elmore, a Deputy Surveyor, and was appointed a D.P.S. on October 31st, 1833. He never married, and always resided on a farm in the north end of the township of Tyendinega, near the village of Roslin, with his sister Anne, Mrs. Robert Gillespie. Mrs. Gillespie had a large family of boys, and one daughter, who became the wife (still living) of the late Charles Fraser Aylsworth, O.L.S., of whom Fraser Aylsworth, O.L.S., is a son. The days of the late John Emerson were the harvesting time of abundance for Surveyors, but through improvident ventures, involving him in protracted litigation, he lost what money he had accumulated by virtue of his extensive and varied practice of surveying. His surveying territory extended throughout the County of Hastings and the adjoining counties of Prince Edward, Lennox and Addington, and Northumberland. Those were the days of genuine side-line disputes and consequent litigation. His extensive experience on such judicial surveys gained him a very prominent position in his survey territory, where his surveys, judgment, and decisions were seldom disputed because of his skill and faultless integrity.

In the words of Tennyson: "And he said fight on," he continued surveying until old age incapacitated him, and even then, although in comfortable circumstances, he persisted in going, going, with the insistent protests of his relatives and friends ringing in his ears, although

"Time and its ally, Dark Disarmament
Have compassed me about,
I fling defiance at them as I cry,
Capitulate? Not I."

But John Emerson, P.L.S., did capitulate, and die, on the 24th of February, 1884, at the age of eighty-six, as is inscribed on the tall tombstone, marking his last resting place, in the little cemetery of the Church of England at Roslin.

Many candidates for the Surveying profession selected him to become articulated to. Many of those successful candidates subsequently became distinguished citizens in various walks of life. The candidates who became articulated to him were:

J. J. Haslett, who was appointed surveyor in 1843.

William Dean, who was appointed surveyor in 1847.

Thomas Webb Nash, who was appointed surveyor in 1854.

David Williams, who was appointed surveyor in 1864.

Charles Fraser Aylsworth, Sen., who was appointed surveyor in 1861.

He was a man of very decided opinions on most topics, and was contemptuous of opinions that differed.

One of his hobbies was the practice of the thrilling branch of dentistry, the extraction of troublesome teeth with the old-fashioned turnkeys. No doubt his happy patients would sing "Stop your tickling, Jock." Then the modern forceps superseded the turnkeys, and whither he went they went also. His only charge or compensation for this service being the satisfaction of pulling the teeth.

Mr. Emerson made surveys for the Government as follows:

1835—Lands in 1st and 2nd concessions of Sophiasburg.

1837—Lands north of Black River, Marysburgh.

1857—13th concession of Rawdon.

1859—Part of boundary, Sophiasburg and Hallowell.

1861—Gore lot in Belleville.

1871—Gore "G" and 3rd concession, Sophiasburg.

He also made survey of an Indian Reserve near Pene-tanguishene.

ARTHUR RANKIN



In the annual report of 1921 will be found a biographical sketch of Charles Rankin, P. L. S., of Owen Sound, in which his youngest brother, Arthur, is mentioned.

Their father, George Rankin, was born October 1st, 1762, in the North of Ireland, served as an officer in the Peninsular War and emigrated to Canada in 1790. For some years he lived at Montreal, where the third son, Arthur, was born, in 1816. Arthur attended school in Montreal, but when a youth he ran away to sea, serving on the Atlantic. George, the father, was a school teacher in Montreal, and later moved with his family to

the County of Essex, where he continued at school teaching in the districts about Sandwich and Amherstburg. He died at By-town (now Ottawa), when engaged in teaching there in September, 1884.

Arthur was in Sandwich in 1830, but not obtaining employment went to York (Toronto). Where he was employed for the next few years is not known.

Before duelling was suppressed by law, gentlemen settled their disputes by challenging their adversaries to mutual combat. In 1836 young Rankin fought his first duel with Henry Richardson, a relative of Col. Brush, of the Brush farm, near Detroit. The event took place on Belle Isle, opposite Detroit, and Rankin was the victor, Richardson being severely wounded. The cause was a young lady, the weapons pistols. From this it would appear that he was then living at home with his mother.

Upon the outbreak of the Rebellion in 1837 he volunteered for service and was made an ensign in Captain Sparks' infantry company, stationed at Sandwich.

When Windsor was raided by the American sympathisers, young Rankin, then a Lieutenant, took an active part in repelling the invaders, two of whom were taken prisoners. Colonel Prince, then in command, ordered the prisoners shot, and they were "shot accordingly," as he then reported. Rankin is said to have been in command of the firing squad. This execution took place immediately opposite where the Hotel Dieu stands.

He fought a second duel with a young son of the Duke of Richmond, who challenged him for a supposed affront. It appears that two attractive young ladies had agreed to accompany the young man on a drive or ride, but for some reason overlooked their engagement and went with Arthur Rankin instead. The duel followed, but as Rankin was a good shot and his opponent a poor marksman, the former fired high and other's shot went wild. The young man afterwards admitted that he was a fool, and the two became fast friends, and young Richmond gave Rankin a signet ring, which, however, he returned to the Duchess of Richmond after her son's death. When Rankin was in England, some years afterwards, he was entertained at the home of the Duchess. The date of this second affair was about 1837 or 1838.

He took an active interest in the Militia, and eventually rose to the rank of Colonel.

Arthur Rankin qualified as a Deputy Provincial Surveyor on April 6th, 1836, when only twenty years of age. It is to be noted that he qualified before the Rebellion, and before his marriage.

Arthur Rankin practised surveying and engineering at Sandwich, but he was a born promoter and speculator.

In 1843, in company with Captain Keating, he organized a band of Ojibway Indians and visited Great Britain, where he produced the first Wild West Show. This venture proved remunerative and they cleared about \$75,000. Upon his return, in 1845, he went into real estate and shipping, and from that to mining operations.

In 1846 he opened the first mine at Bruce Mines, afterwards consolidated into the Montreal Mining Company. When

the Steamer Cathcart came down the Lake with 300 tons of ore, in the Spring of 1847, consigned to Baltimore, it carried the first cargo from that rich field of mineral wealth that came down the Lakes.

Shortly afterwards he withdrew from this company and sold his interest for £30,000. He then became interested in gold mining on the Chaudiere River, Lower Canada. Some gold was extracted, but it was not a paying venture.

In 1848 Alexander Vidal, P. L. S., prepared a map of mining locations on the River St. Mary and Echo Lake. Four "locations" are shown on this plan. From west to east they were known as Clark location, 6,400 acres; Elliott location, 6,400 acres; Lemoine location, 6,400 acres, and Simpson location, 6,400 acres. The Indian village at the mouth of Garden River, is within the Lemoine location.

The Clark location was acquired by the Sault Ste. Marie Mining Company, in which Col. Arthur Rankin was the moving spirit, in 1849, and mining operations were commenced, but after an outlay of \$1,500 work was suspended until 1853, when work was vigorously prosecuted for the season. A good road was built from the river front to the mine, buildings were erected and some ore mined.

The ore was similar to the copper ore at Bruce Mines, then being operated by the Montreal Mining Company, to whom Col. Rankin sold it. At the end of 1853 the Sault Ste. Marie Mining Company suspended operations to await results at Bruce Mines, which proved to be a great disappointment. The younger company attributed the failure at Bruce Mines to extravagant management. In 1860 mining was resumed on the Clark location and additional buildings erected. The mines at last succeeded in convincing the Crown Lands Department that part of the land should be granted as a mining location at \$1.00 per acre, and the balance at 20 cents per acre. The mine in this location was known as the "Emerald Mine."

William Gibbard, P. L. S., on January 21st, 1861, and Albert P. Salter, P. L. S., on September 14th, 1863, reported on the property.

The final Crown grant was made to Arthur McKee Rankin by patent dated Quebec, April 1st, 1865, the price paid to the Government being \$2,560.

When mining operations ceased and colonization attempts began cannot be now ascertained, but Col. Rankin spent a large sum of money on this property.

A townsite, called Petora, was laid out by Joseph Cozens, but it did not materialize. The land had been burned over before mining began, and upon clearing the burned timber and underbrush the soil was found to be gravelly or solid rock, and unfit for agriculture. This enterprise was a financial failure, and the Colonel became heavily involved in his attempts to develop the property.

Eventually the Rankin location passed into other hands. About 1918 the pulp wood upon this property sold for a sum said to have been \$250,000.

Some years later he acquired the timber on Fitz William Island, south of Manitoulin Island, in which deal Joseph Cozens appears to have had an interest, but after the timber was disposed of he sold out.

One of his latest ventures was the purchase of Bois Blanc Island, in the Detroit River, opposite Amherstburg. He experienced difficulty in making payments on this property, but his son came forward and made the final payment.

Col. Rankin took an active part in politics, and as early as 1848 he wrote an article for publication, advocating a confederation of all the Provinces, which received considerable attention and much adverse criticism. He had the satisfaction of seeing his dream realized in 1867.

In 1851 he made his first appearance in politics. He ran as Conservative candidate in Kent, but was defeated by the Hon. George Brown. In 1854 he ran in Essex, against Albert Prince, son of Col. John Prince, and was elected. Later he ran against John Prince and was defeated. In 1857 he was again defeated, but in 1861 he won against Hon. John O'Connor. In 1867, after Confederation, he was defeated by O'Connor, and again in 1872, after which he dropped out of politics.

In 1840 he married Mary, the eldest daughter of Alex. McKee, of Sandwich, one of the pioneers of the district. They had two sons, the eldest, George, being a playwright and novelist. He married a daughter of Sheriff Hall, of Chatham, who died at the birth of an infant. He afterwards married Miss Benson, of St. Catharines, but there were no children.

He died about ——— at Sault Ste. Marie. The second son, Arthur McKee Rankin, was born 1844. When attending Upper Canada College he ran away with a travelling theatrical troupe. He was found by his father at Rochester but refused to return home and eventually became an eminent actor who was seen on the stage by many now living. One of his successful roles was Rip Van Winkle and the Danites. He retired from the profession a few weeks before his father's death, his last appearance being at the Lyceum Theatre, Detroit. He died in 18—, leaving two daughters, both of whom married actors, the eldest married Sidney Drew, the younger, Harry Davenport. Sidney Drew's only son was killed in the Great War. After the death of his first wife he married again.

About 1853 Arthur Rankin purchased a home for his widowed mother and his two unmarried sisters, Susan and Kate, in Toronto, on the north side of Queen street, a short distance west of Bathurst Street, and afterwards used as a Deaf and Dumb School. This residence was a fine old mansion set in large grounds, with a driveway. His mother died there in 1856, and his sister Kate shortly afterwards. Susan died in 1864.

He died at the Hotel Dieu hospital on March 13th, 1893, of a dropsical affection, and was buried in the Roman Catholic cemetery, Sandwich. The pallbearers were Judge Woods, Sheriff Mercer, Chatham; Judge Horne, Judge McHugh, Wm. Boomer and Miles Cowan, Windsor. Shortly before his death he made the following remarks on passing events:—"For my own country some great change will surely come within the next quarter of a century, and if I were young again the scheme of Imperial federation would commend itself strongly to me. It may be mythical or perhaps impossible, but nothing can be fairly called a myth that all agree would be a success if it could be accomplished."

Col. Arthur Rankin occupied a conspicuous place in the history of this Province, as a soldier, a promoter of enterprises to develop Canadian resources, and as a politician. He was a man of wide intellectual accomplishments, of cultured tastes and with striking dignity of manners. He was a patriot, an Imperialist and an optimist.

His brother, Charles Rankin, of Owen Sound (See Report, 1921), and his nephew, Charles Edward Rankin, son of his

eldest brother, Dr. John Rankin, of Picton, Ontario, were also Land Surveyors.

The materials for this sketch and the portrait, were furnished by Mrs. Mary Hutchins, only daughter of Charles Rankin.

HUMPHREY YOUNG,

By Mrs. Margaret McDermott.

Humphrey Young was born October 8th, 1819, in the County of Wexford, Ireland, from which place the family emigrated to Canada, reaching Quebec in April, 1827. His father, Christopher Young, was born in the year 1785, and died May 11th, 1827, shortly after arriving in Quebec, and was buried near Wolfe's monument. His mother, Elizabeth Beale, was born in 1783, married in 1805, and died in 1854. Of a large family six children lived to maturity: John, born 1806, died 1890; Samuel, born 1808, died 1883; Benjamin, born 1810, died 1883; Elizabeth, born 1817, died 1901; Humphrey, born 1819, died 1845, and Christopher, born 1823, died 1898. These dates are taken from an old Bible brought by the family from Ireland.

Humphrey Young's maternal grandmother's name was Humphreys, hence the name Humphrey. On the death of Christopher Young, Sen., at Quebec, the widow, with her children and others from the same part of Ireland, made their way up the St. Lawrence in what were known as "Durham boats," which were propelled by long oars and in shallow places by poles. I imagine these boats must have been similar to what the Voyageurs used, and called "batteaux." Eventually Brockville was reached, and the widow bought a small farm and established a home near that place. The usual hardships incidental to pioneer life of that time were bravely met and successfully overcome, and the children kept at school when there was one within reach. At school Humphrey early showed signs of marked ability, and supplemented his meagre opportunities at school by studying at home at night by the light of the fireplace, and took his first instruction in land surveying from two men, Wm. Evitt or Evett, who lived four miles away, and a Mr. Rath, the latter, I think, himself a surveyor. I have heard my father, Christo-

pher Young, tell how Humphrey would do his share of the "chores," get his supper, and start, after dark, for William Evitt's, study and read for an hour or two, come home and creep into bed with him, and after lying still for an hour or so pondering over the solution of some problem, would get quietly out of bed and tip-toe over to the fireplace, rake over the coals to make a light, then with the help of a bit of charcoal and a chip, work out the solution, cover the coals with ashes to keep the fire in, creep back into bed and sleep contentedly till morning. He studied for the love of learning, and not with the object of becoming a surveyor. We know from his books and from hearsay that he studied Latin, Greek, French and astronomy at least, and occasionally he would walk five miles to get a French lesson. Perhaps all surveyors can calculate eclipses, but to us it seemed very wonderful to hear that he could calculate eclipses of the sun and moon as far in the future as he cared to. A cousin remembers hearing a gentleman who was visiting at our old home in Lansdowne say that if Humphrey Young had lived the world would have heard of him.

From a diary which is in the possession of a cousin living in Brockville we gather that he attended Upper Canada College, Toronto, in the early '40's, travelled from Gananoque, where he was then living, to Kingston, on horseback, and the rest of the way by boat, returned to Brockville by boat and stayed all night at Ogle R. Gowan's. When surveying in the village of Gananoque the Hon. John McDonald, who was a friend of his, presented him with a lot in the village. He went to Westport from Gananoque and worked under John Booth, P.L.S., of Lyn. I have heard my father say that in Montreal there is (or was) the skull and antlers of a deer embedded in the trunk of a tree found by Humphrey Young in Leeds County in the pursuit of his professional duties, and presented by him to a museum, which, I think, was connected with a college or university in that city. This curiosity bore the name of the finder, with the date and place of discovery.

I have before me a work on astronomy that belonged to him, and his name on the fly leaf, "Humphrey Young, D. P. Surveyor, Ballycanou." The date of publication is 1794, the long S is used throughout. It is the 9th edition, and is written by James Ferguson, F.R.S., is entitled "Astronomy, Explained Upon Sir Isaac Newton's Principles," and includes an

account of Mr. Horrox's observation of the Transit of Venus in the year 1639, also a number of plates explanatory of the solar system.

I have also, among other books of his, a Latin Testament, with the following written by him on the fly-leaf: "Look not upon the past, it will never return. The present is yours, use it well. Go forth to meet the future with a brave and manly heart."

Uncle Humphrey was engaged to a young lady, Miss Charlotte Legge, of Gananoque, who with her family were what were known as "Teetotalers," and he pledged his word to her that he would never taste spirituous liquor. One cold night when he and his men were on the shore of Charleston Lake, waiting for the proper time to take an observation of the North Star, he was taken with a chill. As he paced back and forth to keep warm he told my father and a man named Jim White of feeling the chill, and White, who had a flask of whiskey, offered it to him, but he refused it, on account of his pledge. Having taken the observation, he went home and to bed. He had taken a bad cold, which developed into consumption. The length of his illness is not certainly known, but I think my father said it was about two years, so that all his work was done before he was twenty-three and one-half years of age—a short life, but a full one.

In order to appear older than his years he never shaved from the time he was seventeen years old, and his age was never questioned.

His people were Anglicans, and very religious. When asked on his dying bed if he wished to recover, he said: "No, I am prepared to go now; another time I might not be." At the time of his death, which occurred March 11th, 1845, he was Secretary of the Grand Lodge of Free Masons of Upper Canada. His funeral service was conducted under the auspices of the order of Free Masons, from St. Peter's Church, Brockville, and he was buried in the cemetery there, where a tombstone was erected to his memory by his devoted sister, Elizabeth.

The foregoing sketch of Humphrey Young was prepared by Mrs. T. A. McDermott (Margaret Young, daughter of Christopher Young, Junior). Mrs. McDermott is now living at Kentvale, St. Joseph's Island, Lake Huron.

From the date that Humphrey Young qualified as a Land Surveyor on November 11th, 1840, until his death in 1845, he was actively engaged on professional work in the County of Leeds. He served his time with John Booth, a very exact Surveyor, and continued in his employ after he qualified.

On March 27th, 1841, he notes as follows:—"Went to Brockville, got \$157 at the office of the Commercial Bank, being the remainder of the money for the Leeds, Pittsburg survey. Paid to John Booth for Charles Booth \$78, 7½ pennies."

On April 12th he notes:—"Went to Charleston and James Moulton's. 13th surveying for James Moulton the town line between Young and Escott."

He continued this work until the 23rd, when he came home, having earned \$34 on this trip.

Two additional notes from his Journal are of interest:—

"June 4, 1841. "Training Day." Called at Mr. John L's. (McDonald) and found he had gone to Kingston. Had an interview with the Honourable John, who told me, as soon as I had extended the village and laid it out, to pick out a lot and he would make me a present of it."

"June 7. Finished Dr. Hubble's line. Had a conversation with the Hon. John concerning moral character—going to church—the good effect on the public, and above all, the witness within us of having done our duty. May God at all times and on all occasions enable me to do that which is right in the eyes of the world according to the dictates of a well-regulated conscience."

These extracts show the kind of a man the "Hon. John" was, as well as the serious mind of the writer, who at this time was only twenty-one years of age.

A copy of the field notes of Humphrey Young from April 8th, 1841, to February 22nd, 1844, are now in the possession of Willis Chipman. They include surveys in Young, Escott, Leeds, Lansdowne, Pittsburg, Bastard, Montague, and a re-survey of Fortune's line at the rear of the townships of Young and Lansdowne.

Humphrey Young lived with his mother at Ballycanoe, a hamlet about ten miles west of Brockville.

John Young's children were as follows:—Sarah, Elizabeth, Humphrey, Christopher, Samuel, Edward, John, George, Joseph, Heber, Susan and Margaret. His eight sons were his pallbearers.

The children of Samuel Young, brother of Humphrey, were as follows:—Hannah, Christopher, John, Benjamin, William, Sarah, Mariann, Elizabeth, Humphrey, Robert, Rebecca, Alice, Deborah and Heber.

Benjamin had five children:—Henry, Elizabeth, Humphrey, Christopher and Margaret.

Christopher, Junior's, family were:—Heber, Margaret, Humphrey, Alice, Richard, Mariann, Jenny, Frances and Harold.

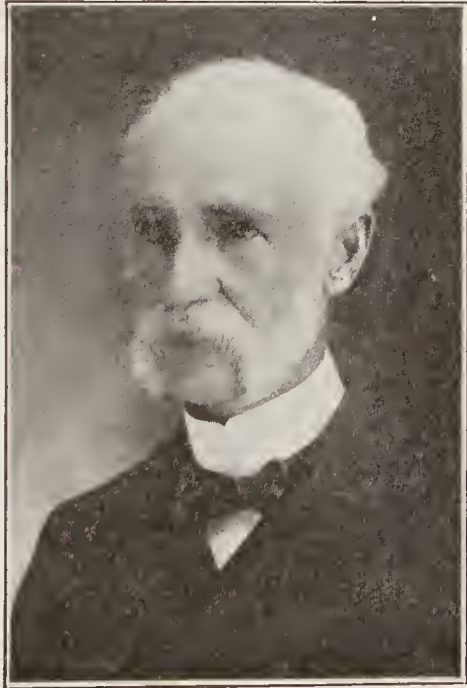
William Young, son of John Young, lived at Brockville and died there many years ago.

CYRUS CARROLL

On December 9th, 1923, our senior veteran passed to his reward at his home in Hamilton. He was born on December 6th, 1834, and qualified as a Provincial Land Surveyor on January 10th, 1860. (Mr. James Dickson was born on October 30th, 1834, but did not qualify as a Surveyor until April 6th, 1867).

In the annual report of 1920 will be found a biographical sketch of Peter Carroll, P. L. S., one of the four sons of Isaac Carroll, the son of John Carroll II., the eldest son of Isaac, whereas Peter was the youngest son.

John Carroll (I.) left New Jersey in 1790 with other



U. E. Loyalists, and settled in North Oxford. He had eight sons, Abraham, William, Isaac, James, John, Robert, Jacob and Peter, all of whom acquired farms in the vicinity of Woodstock and Ingersoll. Two daughters, Ellen and Gertrude, married and remained in the neighborhood.

Isaac Carroll, the third son of John, was the father of four sons and two daughters:—John, James, Robert, Peter, Ellen and Maria.

John II., the fifth son of John I., was the father of Sarah, born 1826; Matilda, born 1828; Edwin, born 1831; Cyrus Philinda, born 1837; and Willard, born 1840. His wife was Sarah Smily, of Woodstock. Peter left no children.

Cyrus Carroll married Ida M. De Zeng on May, 28th, 1863. They had the following children:—Frederick John, born June 1st, 1865; Ida M., born September 22nd, 1867; and Walter H., born April 22nd, 1874.

Frederick John has one son; Ida M. has two daughters, and Walter H. has three sons and one daughter.

The widow of Cyrus Carroll is living in Hamilton.

After qualifying as a Land Surveyor he was employed on the Great Western Railway in Upper Canada. He settled afterwards at Wroxeter in the County of Huron, where he resided from 1861 to 1871. In addition to practising his profession he was postmaster, druggist and conveyancer. He was afterwards appointed Engineer for the County of Bruce, with headquarters at Kincardine. When Walkerton became the County Town he removed there in 1871. In 1877 he moved to Port Elgin, where he practised his profession, ran a drug store, was Village Treasurer and Division Court Clerk. When living in Port Elgin he spent two seasons, 1882 and 1883, in the Duck Lake District, Saskatchewan, near Prince Albert, in surveys for the Dominion Government. He sought this outdoor employment for the purpose of regaining his health, which had become impaired owing to office work.

In 1887 he returned to Hamilton, but went to Prince Albert in 1899, and to Regina in 1911, where he had a position with the Provincial Government, who were loath to relinquish him, and held his resignation for a year in hope he would return to resume his position. On his final return from the Province of Saskatchewan, in 1915, he took up his residence for a short time in Toronto, and later at Hamilton.

Mr. Carroll contributed two practical papers to the Proceedings of the Association:—The Transit, and How to Use It, 1893; Azimuth and Time by Observations on Polaris, 1900.

Cyrus Carroll was a Mason, an Anglican, and a Major in the Militia. He was a non-smoker and temperate in all his habits. His eyesight remained good until after his eighty-fifth year. He attributed this to his habit of lighting all lights required as soon as there was need, instead of reading or working as long as possible without the lights. His chief forms of recreation were reading historical works and solving difficult mathematical problems.

In stature he was slightly over six feet, and muscular rather than heavy. There was no tendency towards increasing weight after his fortieth year.

We are indebted to Walter H. Carroll for the information in this sketch.

W. A. Ducker, O. L. S., of Winnipeg, and formerly of Port Elgin, served his apprenticeship with Mr. Carroll.

For the Department of the Interior, Ottawa, Mr. Carroll made surveys as follows:—

1882—Subdivision and outlines in Township 41, R. 1.2.3.; Twp. 42 A., R. 1, and Twp. 40, R. 5, all west of 3rd M.

1898—Trail from N.E. boundary T. 44-26-2 to Wakaw Lake.

1900—Subdivision and outlines in Southern Manitoba East of Principal Meridian.

1904 and 1905—Trails in vicinity of Prince Albert, Sask.

COSFORD CHALMERS FORNERI



The history of the Forneri family, as presented by John King, M.A., K.C., in his book, entitled "McCall, Croft, Forneri; Personalities of Early University Days," dated 1914, reads like a mediaeval romance. The founders of the Forneri family were Frenchmen, who took part in the Crusades. The principal ancestral records, however, were confiscated by the Italian Government in 1821. Before the Reformation they were, of course, Roman Catholics, but were afterwards Huguenots. Upon removing from France to Italy they became Catholics again and settled in the once Imperial City of Rome a few

years before the massacre of St. Bartholomew.

David Emmanuel DeForneri was a lawyer, who married a daughter of a wealthy physician, which marriage brought with it a large property, including an estate called "Il Macagno," a few miles from the city of Turin, at which place James Forneri was born, in the Summer of 1789. During the French Revolution Italy was invaded, and the Forneris were driven from their home. His grandfather and father died from fatigue and exhaustion, and James was left an infant with his mother, one brother and three sisters.

After three years study in Divinity, James Forneri took up the study of law and was granted the degree of LL.D. at Rome, and in 1809 was admitted to the Bar at Turin, where his mother then resided.

In 1812 he was conscripted to serve with the forces under

Napoleon in the invasion of Russia. After the Battle of Leipsic, which was lost by Napoleon, Forneri was captured by Cossack Irregulars and kept a prisoner for a short time. After many hairbreadth adventures he was discharged by his captors, and eventually reached his former home.

His family were ardent Royalists, but James was a Liberal at heart and took an active and prominent part in revolutionary proceedings at Turin. The Constitutionals, as those in the Liberal Party were called, were, however, defeated by the Austrian forces in 1821, and Forneri embarked for Spain via Genoa. On May 25th, 1821, he arrived at Barcelona. Forneri and other Italian exiles, whose sympathies were with the Liberal Party, formed themselves into a Rifle Corps on the side of the Constitutional Party in Spain, Forneri being Captain. Conflicts took place in different parts of the country early in 1823, when civil war broke out. Louis XVIII. of France invaded Spain in 1823 for the purpose of reinstating the King. Forneri remained loyal to the Spanish Liberal Party. He was wounded in October, 1823, and taken prisoner. After a short time in France he was permitted to go to England. He arrived in London penniless in May, 1824. He obtained employment for a short time as teacher of Italian in a private school. His mother wrote him at this time, giving him a full account of the happenings in the family, and concluded her letter with the injunction "that he should never forsake the Holy Church in whose communion he was born and reared." Notwithstanding this, he was a Protestant from conviction, and died in mature old age a member of the communion of the Anglican Church. His mother died at Turin on June 13th, 1829, leaving a large estate, part of which was bequeathed to James Forneri, but unfortunately it was escheated to the Crown.

Forneri removed to Kingston-upon-Hull, Yorkshire, about 1829, where he appears to have remained for a few years, then returned to London, where he was married in St. Mary's Church, Islington, on March 13th, 1836, to Elizabeth Susannah Wiles, then sixteen years of age, a daughter of a prosperous English merchant.

Immediately after his marriage, he and his young bride set out for Belfast, where he had received the appointment of Master in Modern Languages in the Belfast Royal Academical Institution. This position he held until 1851, when

he received the offer of teacher of Modern Languages in the Windsor, Nova Scotia, Collegiate Academy. The offer included a free passage for himself and family across the Atlantic, and at an increased salary. This offer he accepted, and arrived in Nova Scotia about the end of November. Early in January he entered upon his duties. Some disagreement arose between Dr. Forneri and the Board of Governors, the result being that he decided to go to Australia, but before sailing he applied for a position in the University of Toronto. He arrived there with his family early in May, 1853, and on May 28th received the appointment to the Chair of Modern Languages, a position he held until after his wife's death, on August 18th, 1862. He was then retired, excepting as Instructor in Italian.

His biographer states "that he was a small, erect, and fresh-complexioned old gentleman. He wore gold spectacles and carried a walking stick with the easy confidence sometimes noticeable in military men. Every student greeted him with a kindly salutation; his courtesy to all whom he recognized was that of a well-bred foreigner. As he politely raised his hat to some passing lady acquaintance he disclosed a high, intellectual-looking forehead, sparsely mantled with hair of snowy whiteness. There was something in the appearance of the venerable 'Professor of Languages,' as he was popularly called, which arrested attention and challenged remark. With the infirmities of age plainly upon him, his features still wore the ruddy health of youth; his keen, deeply-set eyes had in them an almost piercing brightness; force and decision of character marked every lineament of his face. Those who knew him well felt these to be distinguishing qualities of the man at once discernible in the snatches which he gave them of his strange life history. There was a tinge of the romantic running through it all; he had been a right gallant gentleman in his time, and his career altogether was a remarkable one."

He died on September 5th, 1869, and was buried in St. James' Cemetery, Toronto.

Professor Forneri had the following children:—

(1) Mariam Margaret, married Henry Reid, of New S. Wales, died 1907.

(2) Richard Sykes, M.A., B.D., Trinity College, Toronto, late Rector of St. Luke's, Kingston, retired, now of Peterboro.

(3) Cosford Chalmers, the subject of this sketch.

(4) Elizabeth Laura, married Dr. Henry Sutton, of Madoc, Ont.; died 1893.

(5) Edwigi Christina, married Frank Wooten, of Toronto; died 1914.

(6) James Ford, B.A., of Trinity University, Toronto; died in June, 1875, at New York.

(7) Sarah Consuelo, married Rev. Albert L. Geen, of Belleville.

(8) Henry David, Civil Engineer, Los Angeles, Calif.

Cosford C. Forneri was born at Belfast, Ireland, on September 5th, 1842, and was, therefore, nine years of age when he came to Nova Scotia with his parents, and eleven years when he came to Toronto. He took a course in Agriculture at the University, and was also a graduate of the old Toronto Military School. About 1861 he decided to become a Land Surveyor, and served his apprenticeship with F. F. Passmore, of Toronto. On July 9th, 1864, he passed his final examination as a Provincial Land Surveyor, and took up his residence at Madoc, where he remained for some years.

He entered into partnership with Charles F. Aylsworth and Lachlan Kennedy, the name of firm being Aylsworth, Forneri and Kennedy. Mr. Aylsworth withdrew after a short time and the two others continued to practise from 1866 to 1870. Kennedy removed to Manitoba, where he died many years ago.

On December 21st, 1868, he married Miss Isabeel Agar, of Madoc, Ont., daughter of Mr. Thos. S. and Mrs. Agar. Mr. T. S. Agar was a lawyer of repute of Maidstone, England, who came to Belleville with his wife in 1834. In 1863 he was appointed Superintendent of Schools for North Hastings, which position he held until his resignation, in 1873. He died on August 25th, 1887.

Mrs. Seager is the only surviving child of Mr. and Mrs. Agar.

Mr. C. C. Forneri performed the following surveys for the Provincial Government:—

1871—Madawaska River Surveys, probably timber limits.

1872—Part of Twp. of Macgregor and Winter Road from Prince Arthur's Landing to Black Bay, Lake Superior.

1874—Tier of Lots along Dawson Road.

In 1879 walked from Eagle River to Rat Portage.

When he completed the survey of the last township he and his party walked on snowshoes with dog trains to carry the luggage, the entire distance between Fort Francis, on the Rainy River, to Prince Arthur's Landing, in the neighborhood of 300 miles. This journey was made in the Spring time, and was, therefore, accomplished mostly at night. During the day, when the sun was warm and the snow soft, the party slept wrapped in their blankets, lying on the ice. The freezing at night improved the travelling conditions.

In 1875 and 1876 Mr. Forneri was employed on Subdivision Surveys in the vicinity of Rainy River, for the Department of the Interior, Ottawa, in what is now part of the Province of Ontario.

In 1877 Mr. Forneri had a contract for grading on the Canadian Pacific Railway.

He removed from Madoc to Prince Arthur's Landing with his family in 1871, or the year after the first Red River Rebellion, and when not employed on Government surveys he was busy making surveys for private parties, who had staked out mining claims, or in surveying timber limits.

Construction of the C. P. R. westward from Prince Arthur's Landing was commenced in the year 1875, and in 1879 rails had reached Eagle River. Mr. Forneri was then surveying for a Mr. Gibbins in the vicinity of Rat Portage, where he contracted pneumonia, and died on August 15th, 1880.

In November, 1879, Mrs. Forneri, with an infant three weeks old, returned to Madoc from Prince Arthur's Landing, intending to remain there while Mr. Forneri was making a new home for his family at Rat Portage. She was at Madoc when his death occurred, but she did not learn of it for two months afterwards.

In September, 1881, Mrs. Forneri journeyed from Madoc to Rat Portage on business connected with the estate of her husband. She travelled by train and steamer to Prince Arthur's Landing, now Port Arthur, thence by contractors' construction train to Eagle River, at that time the end of the rail. From this point she went by canoe via Lake of the

Woods to Rat Portage. On this trip she was accompanied by her sister, Mrs. James Fitzgerald, Mr. Fitzgerald, and the children of both families. Mrs. Forneri's youngest daughter was then a delicate child less than two years old. George Derry and Charles Flett, both now living in Kenora, were the guides and canoe men on this trip, which took about twelve days. At the mouth of Big Stone River they met Mr. C. W. Chadwick, now local Master of Titles and Registrar of Lands at Kenora, with his wife and daughter, who were travelling from Hawk Lake.

The children of Mr. and Mrs. Forneri were as follows:—

(1) Stodhart S., born at Madoc, October 10th, 1869; Mining Engineer, Haileybury, Ont.

(2) Felix F., born at Prince Arthur's Landing, September 18th, 1871; Editor, "Morden Times," Morden, Man.

(3) Elizabeth L., born at Prince Arthur's Landing, June 17th, 1873; married J. J. Sheridan; died November 15th, 1918.

(4) Cosford C., born at Prince Arthur's Landing, October 1st, 1875; Stationary Engineer, Rat Portage. Died December 5th, 1916, at Port Arthur, Ont.

(5) Muriel I., born at Prince Arthur's Landing, October 31st, 1879; married John Armstrong, Keewatin, Ont.

In 1883 Mrs. C. C. Forneri married Edmund Seager, O. L. S., whose biographical sketch appeared in the 1923 report.

Mr. C. C. Forneri's abilities and sterling character won for him an honorable position, not only in his profession, but in the community.

He was a Mason and a member of Shuniah Lodge, No. 287, at Prince Arthur's Landing and served as Worshipful Master for a couple of terms.

Charles Batstone, P. L. S., 1875, and Wm. H. Furlong, P. L. S., 1877, served their apprenticeship with Mr. C. C. Forneri.

Mr. Elihu Stewart has contributed the following additional information respecting Mr. Forneri and the surveyors who were employed on Lake Superior during the early years of the Canadian Pacific Railway.

After passing his final examination in the Spring of 1872, Mr. Stewart went to Lake Superior to prosecute surveys for a mining syndicate. At this time Silver Islet was yielding spectacular values in silver, and there was a great mining

boom in the Lake Superior District. Prince Arthur's Landing was the headquarters for mining prospectors and surveyors. There were then located at this point four surveyors:—Arthur C. Crickmore, Charles F. Miles, A. B. Scott and C. C. Forneri, but the last mentioned then had the largest practice. Mr. Stewart went back to Ontario for the Winter. He was in Prince Arthur's Landing again in the Spring of 1873, and returned East in the Autumn. In the Winter of 1875-76 he made a subdivision survey of five or six townships on Rainy River, about half way from Fort Frances and Lake of the Woods. Mr. Forneri was engaged in the same district in the Summer of 1875 and the greater part of the Winter.

Mr. Stewart arrived at Prince Arthur's Landing about November 10th, and eventually reached Fort Frances, a distance of about two hundred miles, his party of ten hauling toboggans made in the bush by them at Lake Shebandowan. They arrived at the point where their surveys were to commence before Christmas Day, and finished his work in April. At Prince Arthur's Landing he dined at Mr. Forneri's on his way home.

THOMAS W. DYAS.

The Dyas family of this Province trace their lineage through Col. Edward Dyas, of Clonturken Place, County Caven, Ireland, who went over to Ireland from England with William of Orange, during the campaign against James II. There is a tradition in the family that the name is Spanish, and that it was originally spelled Dyaz.

The direct descent from Colonel Edward to the subject of this sketch was as follows:—Colonel Edward; John I.; Joseph; John II.; John III.; John IV., and Thomas W.

John IV. was born at Clonturken Place, but about 1850 he went to New Orleans, where he and his family lived until 1858, when they came to London, Canada West. He had the following children:—Ettie Matilda, married Church; Eleanor, married Halpin, John Joseph; Rosetta (unmarried); Thomas Winning; Robert Henry, and William Jacob. The last named is now the only survivor of this family, and from him the family history has been obtained. He is in the publishing business at 33 Richmond Street West, Toronto.

Thomas W. Dyas was born in Ireland on September 2, 1845, and was therefore thirteen years of age when he came to Canada. He decided to take up the profession of Land Surveying, and served under articles with Charles Lennox Davies, who was then practising in London. On January 7, 1865, he qualified as a Provincial Land Surveyor, and probably worked with Mr. Davies that year.



In 1866 he came to Toronto and entered into partnership with Charles Unwin and C. C. Forneri, the firm name being Unwin, Dyas and Forneri. This was the period of the oil boom at Oil Springs and Bothwell, and of the mining boom at Madoc. This partnership continued until 1868, when Mr. Dyas returned to London and opened an office. His practice was similar to that of all surveyors of the time. He was on surveys in the Lake Superior district, probably with Mr. Davies on mining claims.

In 1870 and 1871 he was employed as inspector of drainage work west of London.

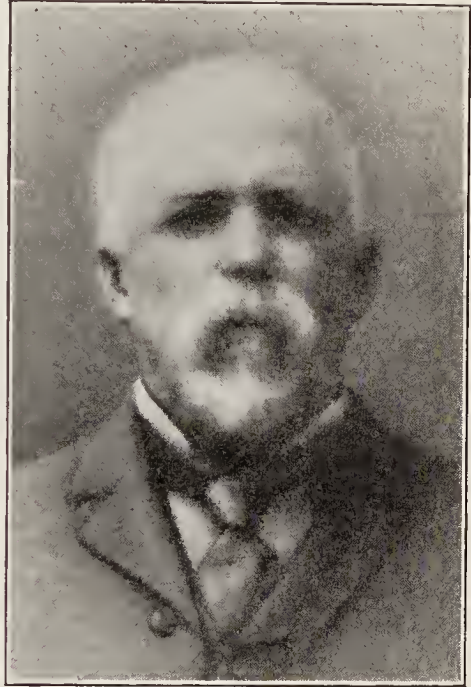
He was an able writer, and from 1872 to 1874 contributed to the "Farmers' Advocate," of London. His articles attracted the attention of the Hon. George Brown, of Toronto, and, as a result Mr. Dyas accepted a position on the Toronto "Globe" in December, 1874, which he held until he went to the "Mail," in December, 1877. He remained on the "Mail" as manager of the advertising and circulation department until his death at his summer home on Toronto Island, on June 22, 1899.

In June, 1871, he married Emma W. Ball, daughter of Ezra Ball, and step-daughter of Ezra Augustus Taylor, of London. Mr. Taylor and Mr. Dyas were intimate friends.

Mr. Dyas had the following children:—Bessie Emma Matilda, married Hugh C. McLean, publisher of Contract Record, etc., one son living. She died May 29, 1897. John Homer, born 1873 in London, in business in Toronto. Annie Ellen, unmarried. Thomas Augustus, married Alice Rust, daughter of C. H. Rust; they live in Boston. Arthur Warren, in business in Toronto. Marjorie, unmarried, in Toronto. Mrs. Thomas W. Dyas is living in Toronto.

WM. G. McGEORGE, SEN.**By W. G. McGeorge, Jr.**

William Graham McGeorge, although of Scotch ancestry, was born in Wales on Aug. 19th, 1838. His grandfather, William McGeorge, was born and died in Scotland. His father, William McGeorge, was a Civil Engineer, having been educated at the University of Edinburgh, and having married Jessie Graham of Scotland. He followed his profession in England, Wales and Scotland until the year 1848, when he moved with his family to the New World and engaged in engineering work in the States of New York and Vermont. About the year 1857 he moved with his family to Canada and settled at Rondeau



(now Blenheim) in Kent County, and there he died in 1866. Beside William Graham McGeorge, he left another son, Joseph, and two daughters, Margaret and Jessie. Margaret had married George Flater of Blenheim, Mr. F. W. Flater, O.L.S., of Chatham, being a son.

William Graham McGeorge, after his early education had been obtained, taught school for a number of years and at the same time studied surveying. He was apprenticed with Sherman Malcolm, P.L.S., and was admitted to practice as a Provincial Land Surveyor on June 8th, 1866, the same year he lost his father. He practiced at Rondeau for a time, but later moved to Chatham, where he practiced during the remainder of his life.

During the first years of his practice he did a great deal

of survey work, retracing and running lines in Kent and the adjoining counties.

For the Provincial Government Mr. McGeorge made a number of re-surveys, the most important being as follows:

1872—9th concession Aldborough, line between Counties of Elgin and Kent.

1873—Five concession lines in Raleigh, and one concession in Oxford.

1876—Re-surveys of certain lines in E. Dover and Oxford.

1877—Two concessions in Romney, and lots in Howard.

1881-85—Middle Road, Twp. Oxford.

Early in his career, however, he turned his attention to the engineering work necessary for the draining and reclaiming of much of that portion of the county, and it was largely to work of this nature that he devoted many years of his life.

Of the many gravity drainage works he designed, two might be mentioned, namely, the Little Bear Creek Drain in the Townships of Chatham and Dover and the Raleigh Plains Drain in the Township of Raleigh, both in the County of Kent. The former drain was about twenty miles in length, and its lower reaches had a bottom width of forty-five feet. Its cost aggregated sixty thousand dollars, which was a large sum at the time of its construction, about 1893. The Raleigh Plains Drain was about five miles in length, provided an outlet for eighty or ninety thousand acres of land, and had bottom widths from twenty to eighty feet. Its cost was fifty thousand dollars or thereabouts.

Of the embanking and pumping schemes which he designed, the Skinner Drainage Works and the Pike Drainage Works in the Townships of Chatham and Raleigh, respectively, were among the most noteworthy. The Skinner Drainage Works reclaimed about five thousand five hundred acres of land, and the Pike Drainage Works over three thousand acres, and although large portions of these lands are below lake level, they are among the most productive in Western Ontario.

In addition to his drainage work, Mr. McGeorge had charge of the construction of many large bridges over the River Sydenham and River Thames, he having acted as County Engineer for the County of Kent for upwards of twenty-five years. Among these bridges might be mentioned the Wallace-

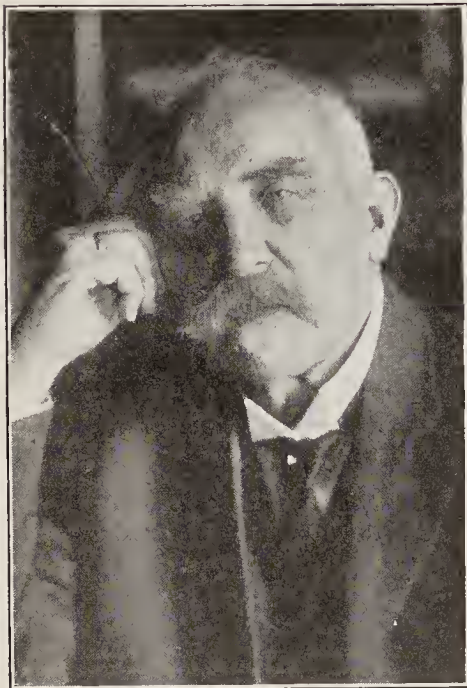
burg Bridges, Tupperville Bridge, Dresden Bridge, Bothwell Bridge, Moraviantown Bridge, Thamesville Bridge and Kent Bridge, all of which are from two hundred to four hundred feet in length.

Mr. McGeorge re-surveyed the Moravian Indian Reserve about the year 1903, and in 1906 was engaged in re-surveying the Walpole Island Indian Reserve in the St. Clair River when he was stricken with heart trouble. He was removed to his home at Chatham, but on July 1st passed away.

During his practice he had a number of apprentices who afterwards became well known in the profession, of whom might be mentioned Mr. James A. Bell, St. Thomas; Mr. Alex Baird of Leamington, and Mr. F. W. Flater of Chatham.

Mr. McGeorge married Miss Jane Gardiner of Chatham in 1873, and to them were born seven children, of whom three died in childhood. In 1901 Mrs. McGeorge passed away, leaving four children, Ethel, Sybil, Flora and William Graham, all of whom are still living at this date.

OTTO J. KLOTZ



In the year 1837 Otto Klotz, Sen., came to Upper Canada from Kiel, in the Duchy of Holstein, at that time a part of Denmark, where he was born in 1817. "He was of a family of grain dealers and shipping men, and came to New York, without definite intention of remaining in America, on a sailing vessel belonging to one of his uncles, carrying a cargo of wheat to supply a shortage on this side, and taking eleven weeks for the voyage. He went first, with an acquaintance, to the flourishing village of Harperhey, not far from Seaforth, now not even a post office, intending to take up land and pursue farming.

He remained only two months, by which time he concluded that he was better fitted for some other occupation. Hearing of Preston as a German settlement, he without loss of time went there, and soon decided to remain. He purchased a small brewery, which, it appears, had been abandoned, and carried on a brewing business for some time with a Dr. Ebert as chemist." In 1839 he erected a hotel, which he conducted for over forty years. In 1862 he started a starch factory, which did not prove satisfactory and was discontinued.

He was a leading man in the community, and took a leading part in civic affairs and in education. He compiled and published a German grammar, was appointed School Commissioner for the County of Wellington 1841, Clerk of Division Court 1848, was School Trustee for many years, and founder of the Preston Mechanics' Library with books from his own library in 1871. In 1882 he retired to private life. He was a

member of Grand River Lodge, A.F. and A.M., and Grand Master for the district.

On April 1st, 1839, he married Elise Wilhelm, who was born at Breitenbach of Hesse Cassel, Germany.

He died at Preston on July 6th, 1892, and his widow on August 22nd the same year.

They had five sons and two daughters, as follows:

(1) Dorothea F., born Dec. 28th, 1839, married Dr. Rudulf Mylius, Kitchener.

(2) Jacob E., of Kitchener, born Dec. 21st, 1840, died Jan. 5th, 1924.

(3) Christian H., born Oct. 22nd, 1843, died April 12th, 1874, at Preston.

(4) Augusta W., born Aug. 20th, 1845. Unmarried. Kitchener.

(5) Carl E., dentist, St. Catharines, born July 24th, 1847.

(6) Otto Julius, Ottawa, born March 31st, 1852, died Dec. 28th, 1923.

(7) Emil W., Toronto, born Dec. 15th, 1854.

Dr. Carl has one son, Waldemar C. Emil had one son, Herbert N., killed in Great War, April 23rd, 1915, also one daughter, now Mrs. Wm. O. Langdon of Timmins, Ont.

Otto J. received his primary education at the Public Schools and the Galt Grammar School, then conducted by the renowned Dr. Tassie, to which he walked every day from his home in Preston. He then (1869) matriculated at the University of Toronto in Arts and in Medicine, but decided to follow Engineering. In 1870 he went to Ann Arbor, Michigan, where he obtained the degree of C.E. in 1872, being the youngest graduate in his class.

During the summer holidays in 1871 he acted as assistant to Hugh Wilson, P.L.S., of Mount Forest. After graduating, he opened an office as Engineer in Guelph, then at Preston, where he continued to practice until 1879.

It may be remarked here that Dr. Klotz commenced a diary on 16th Aug., 1866, in ledger form, which he continued in its original form without one missing day, which indicates that he enjoyed exceptionally good health. To be strictly accurate, there is one day missing, the day he lost when he went around the world. This diary of thirty-odd volumes is now filed with

Federal Archives, Ottawa, but is not to be made public for twenty-five years.

He served under articles with Milton Schofield, P.L.S., for either two or three years, and qualified as a Provincial Land Surveyor on January 6th, 1876.

In 1875 he had been employed in Manitoba for the Dominion Government, this being his first visit to our great West. In 1877 he qualified as a Dominion Land Surveyor, and in 1879 as a Dominion Topographical Surveyor. It was in this year that his career as a surveyor in Western Canada began, his first work being a contract survey in the Turtle Mountains District, Manitoba. Lindsay Russell, then Surveyor-General, expressed the opinion that Mr. Klotz's work was too good for contract work, and next year, 1880, he was engaged on outline surveys in the Touchwood Hills. His work in the following years to 1918 was epitomized by Dr. Klotz as follows:

1881—Base Line Survey, 3rd base north of Moose Mountain, the Great Buffalo Plains.

1882—Base Line Survey, 5th base west of 4th meridian, 110 degrees west. Drove 1,000 miles via Calgary, Macleod, Ft. Walsh, Benton to Butte (Mon.), thence by rail to Salt Lake and California, and home by Yuma.

1883—3rd Base Line west of 4th meridian to R. 20. 2nd Base Line west from R. 24 to 4th meridian.

1884—Exploratory Survey to Hudson Bay via the Saskatchewan River. He went from Winnipeg by train to Swift Current, thence overland 30 miles to the waters of the South Saskatchewan, thence 350 miles to the Forks, where the real journey began. He was told by H.B.C. people that he was the first white man to descend Nelson in canoe in nineteenth century. He attended a grand ball at Norway House on this trip. J. G. M. Christie, now of Toronto, was then an officer of H.B.C. at Norway House, and remembers well this function and his first acquaintance with the young scientific explorer.

1885—Inauguration of systematic longitude or astronomical field work from Pacific Coast eastward in railway belt. Word "Astronomer" used for first time by Department, and Mr. Klotz was so designated.

1886—Complete Azimuth Survey of C.P.R., Rocky Mountains to Revelstoke. In this year he sent a collection of trilobite fossils from Mt. Stephen to the University of Michigan which created great interest.

1887—Astronomic work, determining longitude of Wapella, Port Arthur, Kalmar. Appointed on Board of Examiners, D.L.S.

1888—Astronomic work, Kamloops occultations, longitude of Edmonton.

1889—Computations, B.C. railway belt surveys. Confidential mission to Alaska and San Francisco. Elected Fellow of American Association for Advancement of Science.

1890—Re-survey of 12th base east of Prince Albert and 14th base west of 3rd meridian.

1891—Exploratory survey, Cedar Lake, Manitoba.

1892—Trans-Atlantic longitudes. In this year his family moved to Ottawa from Preston.

1893—Commenced survey of Alaskan boundary. In charge of steamer "Thistle," Port Simpson to Juno.

1894—Continuation of Alaskan survey. In charge of steamer "Mystery." Measured motion of Baird glacier with photo-topographic camera.

1895—Office work.

1896—Surveys along north shore of Lake Erie for International boundary purposes. Longitude of Port Stanley and Winnipeg. W. F. King and C. H. McLeod connect Ottawa and Montreal.

1897—Lake Erie survey and computations.

1898—Confidential mission to London, Paris and St. Petersburg re Alaskan boundary. Found valuable original documents re 49th parallel survey, 1858-61, at Greenwich. Visited observatories at Greenwich, Paris, Pulkowa, Berlin, Kiel, Hamburg, Leipzig, and Stuttgart. Conference at Quebec between U.S. and Canada. This was his first visit to Europe.

1899—Office work.

1900—Determined longitudes Rose Point, Owen Sound, Chalk River, Vancouver, Rayside, and Wilno.

1901—Longitude work, Midway, B.C. and Vancouver.

1902—Longitude work, White River. At Washington observing with pendulum, also at Ottawa, Toronto and Montreal.

1903—In charge of Trans-Pacific longitudes, Vancouver, New Zealand and Australia.

1904—Trans-Pacific longitudes. Completing first astromonic girdle around the world. He travelled as follows:

Ottawa, Vancouver, Bamfield, Fanning Island, Suva, Fiji, Norfolk Island, Brisbane, Southport, Sydney, Wellington, Auckland, Doubtless Bay, Melbourne, Adelaide, Freemantle, Perth, Colombo, Aden, Port Said, Cairo, Naples, Rome, Milan, Stuttgart, Berlin, Kiel, Munich, Heidelberg, Oxford, Edinburgh, Leipzig, Greenwich, to Ottawa.

1905—Connect Seattle and Vancouver in longitude. Connect points Lower St. Lawrence, observe at Cambridge (Mass.), and connect Harvard with Ottawa. Moved into new Observatory at Experimental Farm, Ottawa, at Easter.

1906—Observations, Vancouver, Seattle and 141st meridian for longitude of latter. Visited California to study results of great earthquake that destroyed San Francisco; also visited Grand Canyon. Two Bosch seismographs installed at Observatory.

1907—Office work. Began magnetic survey of Canada. Delegate to International Seismological Association at the Hague. Visited European observatories. Attended meeting of American Association of Advanced Science, Chicago.

1908—Office work. Visited Washington. Began issuing monthly seismological bulletins.

1909—Office work. Delegate to International Seismological Association meeting at Zermatt, Switzerland. Visited European observatories. Attended meeting of A.A.A.S. at Boston.

1910—Office work.

1911—Office work. Delegate to International Seismological Association meeting at Manchester. Visited observatories at Winnipeg in autumn.

1912—Office work. Visited observatories in United States, and later visited Victoria, Calgary, Edmonton, Winnipeg, Halifax, St. John's, Nfd.; Charlottetown, Quebec and Toronto.

1913—Office work. Another visit to U.S. Undographs installed at Chebucto, N.S., Victoria, Vancouver, Calgary and Winnipeg. Attended meeting of A.A.A.S. at Atlanta.

1914—Office work. Delegate from Canada to International Seismological Association at St. Petersburg, intending to observe total eclipse of sun on Aug. 21st near Kiev. European war had broken out on arrival at London and stopped journey. Visited observatories.

1915—Office work—Attended A.A.A.S. meeting at San

Francisco. World Exposition. Return via Vancouver, Saskatoon and Winnipeg.

1916—Office work. Spends first holiday since in Government service on Atlantic coast.

1917—Office work. In October appointed Chief Astronomer in succession to late Dr. W. F. King, who died April 23rd, 1916.

1918—Directorship of Observatory and its multifarious duties. Went to Denver in June to observe total eclipse of sun.

1919—Official duties at the Dominion Observatory, Ottawa.

1920—Official duties at the Dominion Observatory, Ottawa.

1921—Carried out determination of Fort Norman on the Mackenzie River by wireless. Duties at the Observatory at Ottawa.

1922—Representative for the Dominion of Canada to the International Meeting of Seismology at Rome, and also representative to the 600th Anniversary of the University of Padua. Also on official business went to London, England, and to Paris. Shortly after his return home he was confined to his house by illness.

1923—Suffered, during year, attacks of angina pectoris. Was able to attend to his duties at Observatory only intermittently. Died December 28th, 1923.

In 1884 the Dominion Government despatched the steamer "Neptune" to Hudson's Bay under the command of Dr. Gordon, to study the navigation problem. Observers were landed at various points to make scientific notes during the season. At the same time Dr. Klotz was entrusted with the command of an overland expedition via the Saskatchewan, Lake Winnipeg and the Nelson River. Near the Forks of the Saskatchewan he occupied the hut of Major Butler, who wrote there "The Great Lone Land." From Fort Nelson Dr. Klotz went on to York Factory. This trip was made in two Peterborough canoes and four men, making on the trip 2,000 miles and eighty-seven portages. He reported adversely on Port Nelson as a contemplated railway terminus owing to the shallow water, and he questioned the commercial value of a railway to Hudson's Bay. For a more detailed account of this exploratory, see Tuttle's "Our North Land" and Departmental Reports.

On Jan. 25th, 1921, Dr. Klotz wrote Mr. John G. M.

Christie, a Hudson Bay Co. official for over forty-five years, but now of Toronto, as follows:

"The name of J. G. M. Christie, what a panorama is opened to my eyes. Norway House in 1884, where I was present at the celebration of the coming of the new factor, Ewan MacDonald, and the departure of Roderick Ross; where the celebrants were mostly Indians; the fiddler the usual half-breed, moving hands, and feet, and arms in unison; the gaudy 'kerchief; the noiseless embroidered moccasins; the loud-voiced caller of the figures of the quadrille and eight-hand reel; the Indian etiquette whereby each man takes his position on the floor and beckons to his lady of choice to join him; the apparent decorum of the daughters of Eve, sitting on one side, and those of Adam on the other, presumably fearing the inflammability of the material. I may say that I learned to play cribbage there on my return from Hudson's Bay in the fall of 1884."

Mr. Christie was at Norway House as accountant in 1881, 1882, 1883 and 1884. His father, William Christie, was chief factor of the Edmonton district for many years, and his grandfather Christie was twice elected Governor of the District of Assiniboia, and at the same time was chief factor at Fort Garry. He built the upper fort in 1834, and designed the lower stone fort, and part of it was built under his supervision about 1832. The north gateway of the upper fort is the only portion of the walls now in existence, everything else being destroyed in 1881-1882. The lower stone fort has been preserved as it was originally built, and is probably the most interesting point on the Red River.

On his survey in 1886 he named many of the now well known mountain peaks in B.C.—Macdonald, Tupper, Mackenzie, Tilley, Begbie, Burgess, Dennis, Hector, and others, and determined their elevations.

Dr. Klotz was the first surveyor to make a return on the nature of the soil, as shown by the pits excavated around the corner posts of sections and townships (in 1891), which method was afterwards adopted by the Dominion Government.

Dr. Klotz and Dr. King had for years advocated the erection of a permanent observatory in Canada. They succeeded in 1902 in inducing the Minister of the Interior, Hon. Clifford Sifton, to authorize the work, and the Dominion Observatory at Ottawa was opened in 1905.

In 1902 he began geophysical investigations by gravity observations with a half-second pendulum, and in recent years he introduced the torsion-balance, by means of which differential gravity observations are obtained for the study of the presence and extent of gas, oil, and salt in the subterranean strata of the earth.

Dr. Klotz made the study of seismology a specialty, and suitable instruments were installed at the Observatory under his supervision.

In 1907 he inaugurated an extensive magnetic survey from the Atlantic to the Pacific and to the Arctic.

He contributed ninety-nine articles to scientific publications, and received recognition from several universities—Toronto, 1904, LL.D.; Michigan, D.Sc.; Pittsburgh, 1916, LL.D.

He was a member of many learned societies, among the more important being the Royal Astronomic Society of England; Royal Society of Canada (President Section III, 1922); Royal Astronomical Society of Canada; New Zealand Institute; Seismological Society of America.

His writings covered astronomy, seismology, terrestrial magnetism, gravity and the wider fields of geophysics. He had a gift of popular exposition of scientific subjects seldom found in the scientist, and similarly his public lectures had a breeziness and charm that put him in instant touch with his audience.

Dr. Klotz filled a worthy place in the early development of science in Canada. The Dominion Observatory, together with a number of special scientific lines of investigation which he inaugurated and carried on, and trained others to follow, will ever remain a lasting memory of him. His cheerfulness was infectious, and in official life he maintained that respect and decorum characteristic of the old school.

Otto Klotz was one of twelve Provincial Land Surveyors who convened the meeting held in the old Parliament Buildings on Front Street West, on February 23rd, 1886, when our Association was organized. Three only of these conveners now survive. Mr. Klotz was the first speaker at this meeting. In drafting the Constitution and By-laws he took a leading part. He took an active interest in the early years of our Association, attended the annual dinners, at which he could

always be depended upon for an address full of encouragement for the Surveyors. In 1905 he was elected Vice-President, and in the following year President of the Association. His opening address as President in 1907 contains much that may be read with profit by the Surveyors of to-day. He presided at the annual dinner at McConkey's on February 27th, 1907. Thos. Fawcett was Vice-President, Killally Gamble Chairman of Committee. There was a large attendance. He contributed to our proceedings the following papers:

1894—Photo-Topography.

1895—Aneroids.

1895—Coefficient of Refraction.

1898—Lake Erie Survey.

1900—Azimuths by Polaris.

1901—Local Deflection of the Plumb-line.

1902—North West Angle.

1907—The Surveyor and Earthquakes.

He attended meetings in 1886, 1887, 1889, 1891, 1905, 1907 and 1909. He was Chairman of Topographical Committee for many years, and member of Committee on Biography since 1916.

At his last attendance in 1909 a group photograph was taken of ex-Presidents (see Report, 1909), all of whom were then living excepting Major Sankey.

On Dec. 4th, 1873, he married Marie Widenmann, daughter of the late German Consul for Michigan. They had the following children:

(1) Max, born Sept. 25th, 1874. M.D., Ottawa. Died Jan. 31st, 1921.

(2) Julius, born Dec. 15th, 1875. M.D., Westboro.

(3) Oskar, born Jan. 21st, 1878. M.D., Toronto, Department of Pathology and Bacteriology, University of Toronto.

Dr. Max left four children: Marie, Dorothea, Josephine and Otto.

Dr. Julius has two children. Thusnelda and Carl.

This sketch has been prepared from information furnished by his son, Oskar, of Toronto, and by R. Meldrum Stewart, his assistant at the Dominion Observatory at Ottawa for many years, and now Acting Director.

The erection of an Astrophysical Observatory by the Dominion was authorized in 1913, and the order placed for the optical and mechanical parts. Construction of the building was carried on in 1914 and 1916, but it was not until April, 1918, that the mounting of telescope was completed. This is a reflecting instrument with 72-inch mirror. The glass disc was shipped from Antwerp about one week before war was declared in 1914.

Dr. W. F. King and Dr. J. S. Plaskett designed this Observatory, and the latter is now the Director at Victoria.

Mr. Elihu Stewart, one of the Committee who, with Mr. Otto Klotz, drafted the original Constitution of our Association in 1886, and who was an intimate friend, has contributed the following:

“ I venture to say that in the history of this country it would be difficult to find any single individual who excelled in so many different pursuits. His activities were so varied (and he excelled in them all) that one wonders how so much could have been accomplished in the time allowed him.

He was a scientist but the very antithesis of the ordinary scientist who seeks out a specialty and disregards all other fields as unworthy his attention, like the old German Professor who had given his life to the study of Greek nouns, and when about to pass away regretted that he had not confined himself to the dative case. Dr. Klotz was perhaps above all an astronomer, who was at home among the stars, but he kept his feet squarely planted on this earth. He took up cosmology, and was the one man who, in this country, developed the use of the seismograph, till Canada now stands high among the nations of the world in this regard. He devoted great attention in later years to this subject, and was one of the foremost men in their international gatherings. It was my privilege when in Ottawa to frequently go with him of a Sunday morning up to the observatory to see whether this old earth had shown any feverish tremors during the previous night.

Mention has already been made of his great work in filling up a large gap in girdling the globe after the laying of the Pacific cable made this possible. Heretofore Greenwich had been connected up with points in Australia by the aid of the telegraph through Europe and Asia, and it was left to Dr. Klotz to carry out the work across the Pacific.

He first stationed himself at an improvised observation station at Vancouver, while he had his assistant at Suva, on one of the Fiji Islands, over 4,000 miles away. As one observed, the hum was flashed across to the other, and vice versa. A great number of observations were made at each of these points. Then Klotz hied himself away to Suva, where he took the place of his assistant, while the latter had moved on to another point, and so on, till finally the point already established through Europe and Asia had been reached. Thus was the girdle completed and the exact position of these and other stations established.

Dr. Klotz was absent on this observatory work a whole year. But for fully six months after his return to Ottawa he was busily engaged in working out the calculations and averaging differences, thus eliminating errors as far as possible.

He had told me that he would have the work completed at a certain time, and we arranged to meet at the Rideau Club at 5 o'clock p.m., when he would know how the work closed. As he came in I told him that from his appearance I was sure the result was satisfactory. Less than 100 feet difference, he remarked, adding at the same time that he would have been satisfied if it had been many times greater, considering not only his own work, but that of so many other observations.

As already intimated, Klotz was a man of many parts. His record as a Land Surveyor in his early days and his travels in the great wilderness of the West and North during that time are alone such as anyone might be proud of, but amid all the foregoing he in some way found time to acquire a wide knowledge of general literature, and in no place was he more interesting than in his own library, which was well stocked with choice books on almost every subject. It was here that I saw most of him. During the eight years of my residence in Ottawa it was my good fortune to have the privilege of a very intimate acquaintance with him. Scarcely a week ever passed when he was at home that we did not have an evening together, either at his home or at the Club, more frequently at the former. We always sat in the library. His dear wife would generally stay with us and enliven the conversation till about 10 o'clock, when she would retire, and more frequently than not it was midnight when I left him. It was hard to get away.

The conversation would lead to a quotation, and in a moment he had the book in hand, and in the next the quotation. He was the most orderly person I ever met. I never knew him to have the least difficulty in finding anything he possessed.

On leaving him I would often say, "Well, I have again succeeded in lessening your sleep by a couple of hours." In his genial way he would say: "No, you have given me a rest. From now to two o'clock I can accomplish all I have to do. You know I seldom go to bed before that hour, five or six hours are all I require."

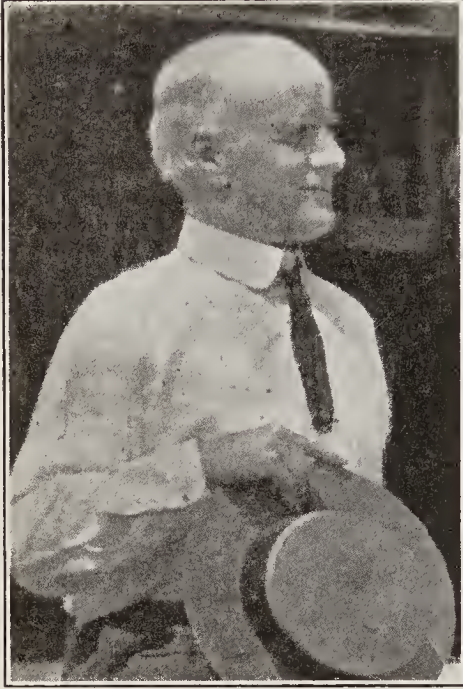
Notwithstanding, I fear that his days were shortened by too little sleep. The last thing he did, every night, was to write up his diary. He carried this always with him, whether to the Saskatchewan, to St. Petersburg, or to the islands of the South Seas. This, I notice, is not to be made public for twenty-five years, and, of course, under the circumstances, I will never see it in full, though he used frequently to refer to it, and often read passages from it.

When it is made public it will in itself be an autobiography. Dr. Klotz was a big man, both physically and mentally, and his heart corresponded with both. Strange as it may seem, he wrote with a very fine pen, and though he wrote fast I am sure I never saw any writing that equalled his, and it was legible as type.

Pardon a personal note. It is hard, very hard, for me to realize that one so full of life as my very dear friend has really passed into the unknown land. My visits to Ottawa can never hereafter be as before. No other greeting so cheerful; no more Sunday walks to the Observatory; no more good-byes at midnight.

"The day Thou gavest Lord is ended,
The darkness falls at Thy behest."

HARGREAVES KIPPAX



Robert Kippax and his wife, Mary Hargreaves, came to Canada from near Colne, in Lancashire, England, and settled near Brantford, Canada West. Their eldest child, Hargreaves, was born in England on July 21st, 1845. They had three additional sons.

John, born Nov. 5th, 1849, who graduated in Medicine, and practised in Chicago. For some years he was President of the Homeopathic College, and wrote several works on medicine, also on astronomy. He died on June 27th, 1922, without children.

George, the third son, was born on August 12th, 1853. He had two children, one of whom, Jessie C., married Mr. Stedman, now living in Brantford. Helen, another daughter of George, unmarried, is also living in Brantford.

Alfred, the youngest son, died when a young man about 1882.

Hargreaves Kippax qualified as a Provincial Land Surveyor on July 7th, 1877. For a time he was engaged on the proposed railway line between Toronto and North Bay—afterwards a part of the G.T.R., now a part of the Canadian National Railway System. He was later employed on the G.T.R. line between Sarnia and Toronto and on the Chicago and Grand Trunk.

In the Report of the Association of Ontario Land Surveyors for 1893, his name first appears in the list of members, and his address is given as Huron, South Dakota. He accepted a position as chief draughtsman to the Surveyor-General of

South Dakota in 1881, where he remained until he received an appointment with the Department of the Interior, Washington, D.C., which position he held until his death, which occurred on April 30th, 1922.

Hargreaves Kippax married Miss Hulda Miller, who was born on January 3rd, 1862. She is now living at Long Beach, California. They had no children.

CHARLES ALBERT BIGGER

"On the afternoon of Friday, Nov. 9th, 1923, in his office at the Geodetic Survey Building at Ottawa, Mr. Chas. A. Bigger, the Assistant Superintendent of the Survey, suddenly passed away. Mr. Bigger, up to the very moment of his death, was actively engaged in the work of the Survey, and apparently in fair health. A year or so ago he had suffered a severe illness, but he had regained much of his former vigor, and his friends looked for many years of usefulness in his chosen profession."



His paternal grandfather was a U.E. Loyalist. His father, James Smith Bigger, was born Oct. 27th, 1816, died May 12th, 1893. His mother, Amelia Kenny, was born March 1st, 1820, died May 12th, 1903. Charles Albert was born near Paris, Ontario, on Aug. 15th, 1853. He obtained his primary education at the Public School in his native town, and at the Normal School, Toronto. He also attended

the Military School at Kingston, from which he graduated in 1874.

On January 6th, 1882, he qualified as a Provincial Land Surveyor after serving under articles for three years with Robert Sparks of Ottawa. He also qualified as a Dominion Land Surveyor in the early part of 1882, and was employed that year on Dominion land surveys in northern Saskatchewan. In 1883 he was appointed Inspector of Surveys in the North-West, covering the district between the Fourth Meridian and the Rocky Mountains, and between the International boundary and the Red Deer River. He continued in the employ of the Dominion Government until 1888, when he took up private practice in the Ottawa Valley, making his home at Plantagenet, where he resided six years. He then removed to Ottawa, where he continued in private practice. His work was always of the highest standard.

For the Department of the Interior, Ottawa, Mr. Bigger made surveys as follows:

1882—Outlines in vicinity of Saskatoon.

1883—Inspection of surveys, Southern Saskatchewan.

1884—Subdivision Townships in Alberta between 4th and 5th meridians.

1886—Subdivision Townships in Alberta west of 5th meridian and trails from Red Deer to Calgary and Macleod.

1887—Subdivision Townships in Southern Alberta west of 5th meridian.

1888—Subdivision Townships in Southern Alberta west of 4th meridian.

In 1901 he re-entered the Government service as the Canadian Surveyor on the re-survey of the Quebec-New York boundary line. He made all the astronomical observations for latitude and longitude. Mr. F. A. McDiarmid, to whom we are indebted for much of the information in this sketch, was Mr. Bigger's assistant on part of this work. He states that "Mr. Bigger had the delicate touch of the skilled observer, and his handling of the instruments, and ceaseless care to secure the most reliable results, made him a master in field astronomy." In 1904-05 Mr. Bigger was employed on boundary survey work in Alaska.

In 1905, in co-operation with the late Dr. Wm. F. King, the Geodetic Survey of Canada was commenced, Dr. King being Superintendent and Mr. Bigger Assistant Superintendent.

"For the last eighteen years he used his unbounded energy, his wide experience, and his good ability, to establish the Geodetic Survey of Canada on a sure and firm foundation. He personally supervised the early work in Ontario, Quebec, and British Columbia.

"The equipment of the Standards Building, Ottawa, was gathered together by Mr. Bigger, and the building was designed and constructed under his direct supervision. He was a recognized authority on scientific instrument construction, and was sent to Europe twice to supervise the construction of special apparatus for the Geodetic Survey.

"In Ottawa he held a high place in the esteem of his associates and of the general public. He was a past President of the Ottawa branch of the Royal Astronomical Society of Canada."

Mr. Bigger was an Associate Member of the Engineering Institute of Canada.

He made no surveys for the Ontario Government.

On August 1st, 1877, he married Louise Coburn Brennan of Ottawa. They had one son, who graduated in Science at McGill, and died July 6th, 1906. There were two daughters; one died January 26th, 1903, the other, Hazel, married Mr. John Dawson of San Francisco.

Mr. Bigger is survived by his widow, one brother, two sisters, and one daughter.

DAVID ALEXANDER NIVEN



One of the younger members of the Association passed away suddenly at his home in Guelph on August 15th, 1923. He was born at Sutton, Ont., on September 30th, 1873, his father being the late Rev. D. P. Niven (Presbyterian), a brother of Alexander Niven, O.L.S., one of the best known Land Surveyors in the Province, and President of the Association 1888-1889.

The grandparents of David Alexander Niven were Robert Niven of Perthshire, Scotland, and his wife, Ann Morrison, of the same place, who came to Canada with their family in early life. Robert Niven died at Niagara-on-

the-Lake on December 28th, 1865, aged 71 years, and his wife died at the same place on July 28th, 1870, aged 77 years. Their children were as follows:

(1) Rev. D. P. Niven, born 1837, died Oct. 4th, 1902. He married Elizabeth McIntyre of Kingston, born Dec. 26th, 1839, died at Guelph, April 9th, 1923.

(2) Alexander, born at Niagara-on-the-Lake in 1836, died in Toronto on May 7th, 1911. Married Margaret McEvoy of St. Marys, Ont.

(3) Jonathan, married Isabella Bolton of Niagara-on-the-Lake, who is now living. They reside at Niagara-on-the-Lake.

(4) Isabella Shaw, born at Niagara, July 10th, 1832, died at Buffalo, June 27th, 1882. Unmarried.

(5) Annie, born at Niagara. Died at the age of three years.

The sons and daughters of the late Rev. D. P. Niven are as follows:

(1) Alice M., born June 27th, 1872. Married Fred Flanders at St. Catharines, Ont.

(2) David Alexander, born Sept. 30th, 1873.

(3) Robert, born March 9th, 1875, at Sutton, Ont.

(4) Jonathan, born November 9th, 1876, at Sutton, Ont.

(5) Huber L., born October 13th, 1878, at Toronto, Ont.

(6) Janet, born October 4th, 1880, at Mount Forest, Ont.

The late David A. Niven was married at Saskatoon on August 16th, 1922, to Miss Elsie Brownridge of Fielding, Sask. He attended the High School at Mount Forest, after which he taught school in the Niagara District. He spent two seasons with his uncle, Alexander Niven, on survey work in Northern Ontario, afterwards articling with George Ross, O.L.S., of Welland.

On Feb. 13th, 1913, he qualified as an Ontario Land Surveyor, and during the following season was employed with Mr. J. W. Fitzgerald of Peterboro in the vicinity of Hearst. He opened an office in St. Catharines in December, 1914, but removed to Guelph, where he built up a splendid practise. He was appointed Municipal Engineer for five townships.

He was a staunch Presbyterian and attended St. Andrew's Church.

Mr. Niven was tall, muscular and of sturdy build, and his sudden demise without any apparent illness was a great shock to his relatives and friends. He was a man of sterling integrity, in professional as well as private matters. In his professional work he was very painstaking and thorough, and exercised the greatest care to obtain all possible information in order to give his clients the best service.

He was a regular attendant at the annual meetings of the Association.

LOUIS A. KINNEAR

By Jennie A. Kinnear, B.A.



Louis Arthur Kinnear, the eldest son of Louis Kinnear, M.A., Barrister, Port Colborne, and Elizabeth Eleanor Thomson, was born of Scottish descent in Cayuga, Ontario, on the 19th day of May, 1889. Ten years later the family moved to Port Colborne, where Arthur received his Public School education. In 1904 he entered Welland High School, matriculating in 1907 and taking Honor Matriculation work in 1908. He entered the School of Mines, Queen's University, in the fall of that year and, after an excellent course, graduated with the degree of B.Sc. in Mining Engineering in 1912, with the

distinction of a Douglas Tutorship in his final year.

During the summers of 1908 and 1909 he was assistant chemist with the Canadian Portland Cement Company (now the Canada Cement Company, Limited) at Port Colborne, Ontario. In the summer of 1910 he was with the resident engineer on construction, Niagara, St. Catharines and Toronto Railway Company, St. Catharines, Ontario. After graduation he was articled for a year to George Ross, C.E., O.L.S., D.L.S., Welland, Ontario, qualifying as an Ontario Land Surveyor on May 2nd, 1913. He opened an office in Welland in that year, but later transferred it to Port Colborne, which he maintained until 1918, during which period he did valuable municipal, township and county work.

In 1914 he was admitted as a Dominion Land Surveyor, and in 1915 was appointed as assistant to J. E. Jackson, D.L.S., on a survey party in Saskatchewan. In 1916 and 1917 he was assistant with the same survey party in northern Manitoba.

In 1918 he accepted a position with the Hydro Electric Power Commission at Nipigon, where he was promoted to the position of first field man on the 1st of May, 1919.

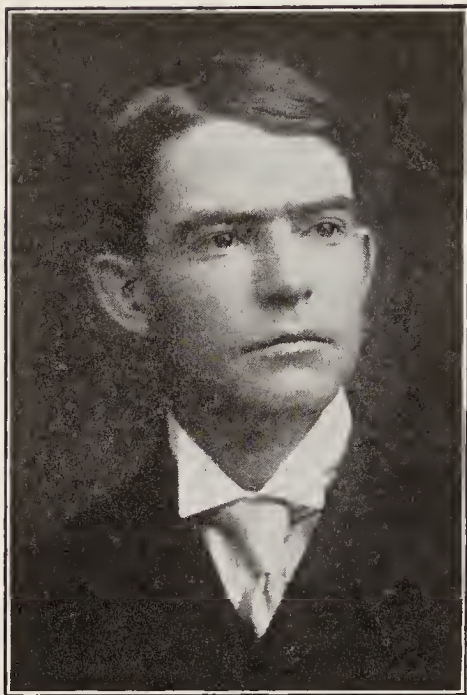
On May 12th, 1919, in his 30th year, he met his death by drowning when the canoe from which he and his party were taking soundings was overturned by an eddy in the treacherous currents of the Nipigon River. Through the efforts and kindly assistance of the Hydro Electric Power Commission, as directed by Mr. Norman Stanley, B.Sc., in charge of the Nipigon Development, his remains were recovered on June 6th, and interment took place on the 8th of June at the family plot in Oakwood Cemetery, Port Colborne.

Besides his parents, he left to mourn his loss, two sisters, Jennie A. Kinnear, B.A. (Queen's, '13), now Mathematical Teacher on the Dunnville High School staff, and Helen Kinnear, B.A. (Toronto, '17), Barrister, who is now practising law in partnership with her father under the name of Kinnear & Kinnear at Port Colborne, Ontario, and one brother, Robert A. Kinnear, who is employed on the office staff of the Government Elevator at Port Colborne.

He was a member of the Presbyterian Church and of the Independent Order of Oddfellows, under whose auspices a very largely attended memorial service was held on the 20th day of May, 1919, in the First Presbyterian Church, Port Colborne.

In the death of Mr. Kinnear, engineering circles have lost a promising member and Canada an excellent citizen.

GEORGE LOUIS RAINBOTH



The Rainboth family were of Dutch descent, and settled at St. Andrews, Argenteuil Co., P. Q., removing to Aylmer after October 4th, 1846, on which date George Charles Rainboth, O.L.S., was born (see Report 1914). The father of George C. Rainboth, O. L. S., was George Rainboth, who was born at St. Andrews in 1821, and died at the family home, "Spruce Grove," on the Hull-Aylmer Road in 1902. Edward Joseph, A. J., and Mrs. E. Treau de Coeli, all of Ottawa, are the surviving brothers and sisters of George C.

George C. had the following children: George Louis, born Aug. 17th, 1884, at Aylmer, P.Q.;

Ernest Clement, born 1890; Louise Catharine (at home); Pauline Eleanor (Mrs. Edward Miall); Lillian Ann (Mrs. R. L. Squire), and Augustine Mary.

George Louis studied surveying with his father. He qualified as a Dominion Land Surveyor in 1910, and as an Ontario Land Surveyor on May 2nd, 1913. In 1906-07 he was topographer on the re-survey of the Quebec-Vermont International boundary, and in 1908 on the New Brunswick-Maine boundary. In 1909-10 and 11 he was employed on reconnaissance surveys and in levelling on the St. John and St. Francis Rivers, and in 1912 on the topographical survey of Quebec-Maine boundary. He was employed on this work from 1915 to 1918, inclusive. In 1919 he made a subdivision of ordnance lands at Ottawa. When with his father he assisted in farm surveys and sub-

division surveys in Ontario and Quebec, surveys of timber limits on the Gatineau, Cologne, Lievre and Rouge Rivers, also subdivision surveys for the Department of Interior in the Western Provinces.

Since 1919 he was engaged in office work in connection with the International boundary re-survey.

George L. was unmarried. Upon the death of his father on Nov. 2nd, 1910, he assumed the responsibility of the family and household, and bravely carried on. He was a devoted son with a true sense of duty always uppermost in his mind. He lived with his widowed mother at 16 Glen Avenue, Ottawa.

About 9 p.m. on Saturday, Nov. 30th, as Mr. George L. Rainboth stepped from the curb to the roadway in front of the entrance to the Hull Electric Ry. terminal at the Chateau Laurier, he was struck down by an automobile driven by Mr. George E. Heath, and died in the ambulance as he was being conveyed to the hospital, without regaining consciousness.

His funeral was held on Tuesday, Dec. 4th, 1923, from his residence to the Blessed Sacrament Church, the interment being at the Aylmer Roman Catholic Cemetery.

The information for this sketch was furnished by his mother and sister.

PAPERS

WATER BOUNDARIES

By R. M. Anderson

This paper is the outcome of some questions regarding the status of boundaries defined by water, which were forwarded to the Land Surveying Committee of the Association, by one of the students trying his examinations this year.

An investigation of these questions opened up a series of similar questions, and it was thought that a short paper on the subject might be of interest to the members of the Association, and at the same time prove useful to other students seeking information regarding such boundaries. In 1896, Mr. A. P. Walker read a very carefully prepared paper covering many of the points raised, and quoting from judgments of the courts. To any who have a copy of that report, I would say by all means look it up and re-read his paper.

I do not propose this afternoon to discuss methods of survey to define or establish water boundaries, but rather to discuss in a general way a few of the principles governing such boundaries, and the effect that erosion or accretion has on ownership bounded by bank or shore.

To better understand the reasons for the various rules laid down, it is well to first consider the rights of the riparian owner, i.e., the owner of the land abutting the water. These are very lucidly expressed by Lord Kingsdown in a judgment of the Judicial Committee of the Privy Council (*Miner v. Gilmour*, 12 Moore P.C. 131): "By the general law applicable to running streams, every riparian proprietor has a right to what may be called the ordinary use of the water flowing past his land; for instance, to the reasonable use of water for his domestic purposes and for his cattle; but further, he has the right to the use of it for any purposes, or what may be deemed the extraordinary use of it, provided he does not thereby interfere with the rights of other proprietors either above or below him." In the same judgment he extends this general law to navigable and tidal rivers as well as to unnavigable and non-tidal waters.

Riparian rights are independent of the ownership of the soil under the water. It is immaterial whether that ownership is in the Crown as represented by the Dominion or Province, or in a private person. Lord Wensledale says (*Chasemore v. Richards*, 1859, 7 H.L.C. 349): "It has now been settled that the right to the enjoyment of a natural stream of water on the surface belong to the proprietor of the adjoining lands as a natural incident to the right to the soil itself, and that he is entitled to the benefits of it as he is to all the other advantages belonging to the land of which he is the owner. He has the right to have it come to him in its natural state in flow, quantity and quality, and to go from him without obstruction, upon the same principle that he is entitled to the support of his neighbor's soil for his own in its natural state." I cannot in digging a gravel pit remove to my neighbor's disadvantage, my soil from where it supports his; neither can I interfere to his disadvantage with the water which abuts his property.

"A riparian owner on a navigable river has, of course, super-added to his riparian rights, the right of navigation over every part of the river, and on the other hand, his riparian rights must be controlled in this respect" (*Lyon v. Fishmongers Co.*, 1 App. Cas. 662).

While the above remarks define the rights in streams, the rights on other inland waters, such as lakes, are of a similar nature, modified so far as is necessary to provide for the different character of the body of water.

According to the Common Law of England, the owners of lands abutting on inland waters, are held to own to the middle of the stream or lake. This ownership, unless expressly denied, is automatic. It is not necessary that the description in the instrument by which title is held read "to the middle thread." If the land described is bounded by the water or the bank, the conveyance is presumed to also include the land under the water. The application of this law to non-navigable rivers in Canada is well established (*Kains v. Turnville*, 1871, 32 U.C.R. 17, p. 22). This is so, even though the description is accompanied by a plan showing to the water only, or mentions an area which is satisfied by the lands to the water's edge or the bank. In *Maclaren v. Att.-Gen. for Que.*, 1914, 15 D.L.R. 855, the court said: "On non-navigable and non-floatable rivers a grant of land along the stream presumes inclusion to the middle thread although the graphic or written description follows the bank." There must be some words forming

part of the description or introduced by way of exception to clearly exclude whatever may be between the water's edge or the bank and the middle thread. This rule was held to apply in the case of a lot on the River Thames patented "Beginning at a post marked 4/5 on the bank of the River Thames: THENCE south 45° east, 68 chains: THENCE NORTHEASTERLY parallel to the said river, 30 chains: THENCE north 45° west to the said river: THENCE along the bank with the stream." It was held by the Court of Appeal that the northerly boundary went to the centre of the stream (Williams v. Pickard, 1909, 17 O.L.R. 547).

Some doubt existed, however, until comparatively recently as to whether the Common Law applied to the larger lakes and the navigable streams of this country. Early decisions of the courts seemed to exclude the Great Lakes from its operations, but about 1908 a suit was brought by the Keewatin Power Co. against the Town of Kenora. This case hinged largely on whether patents along the Winnipeg River should be construed as conveying to the centre of the stream (Keewatin Power Co. v. Town of Kenora, 1908, 16 O.L.R. 184). It was held that they did, and the courts said that the presumption, whether the water were navigable or not, was that titles extended to the middle line. To overcome the situation created by this decision, an Act was passed by the Legislature in 1911 declaring that where land bordering on navigable waters had been patented, unless the grant expressly included the bed of the stream or lake, the presumption was that the bed was not intended to pass to the grantee (R.S.O. 1914, Chap. 31).

Since the passing of this Act, the Ontario courts have held that the bed extends to the water's edge or low water mark only (Carroll v. Empire Limestone Co., 1919, 45 O.L.R. p. 121). In this case, the Crown granted a lot on Lake Erie "Commencing at the south-east angle of lot 6 on the bank of Lake Erie" and the final two courses were "to the bank" and "along the bank to the place of beginning." It was held that the title extended beyond the bank to the low water mark. This interpretation of the limits of the bed differs from that used in the D. L. Manual, where "bank" is defined as the edge of the bed of a lake or stream, and in the next paragraph we read "the bed of a body of water has been defined as the land covered so long by the water as to wrest it from vegetation, or as to mark a distinct character upon the vegetation and upon the soil itself when vegetation extends into the water." D. L.

Manual, Sec. 134. This interpretation would evidently in many places include considerably more area in the bed than will the other.

I may say that some of the older judgments in the province took the view that patents extending to the bank of the Great Lakes, were bounded by the high water mark. For instance, in *Parker v. Elliott*, 1852, 1 U.C.C. p. 470, it was held "the bank as intended in the patent must be taken to mean the land line defined by the high water mark," and the title was held to extend only to that line.

The term "shore" primarily is applied to the area on the edges of tidal waters between normal high water and low water marks as defined by the tides, but is also used on our large lakes to denote the somewhat similar area along their margins, created by the seasonal variations. Lands bounded by the shore include to the edge of the water in its natural condition at low water mark (*Stover v. Lavoia*, 1906, 8 O.W.R. 398). This rule probably does not hold where the shore is that of a harbor, as harbors are under the control of the Dominion. The shore, however, may or may not form part of the harbor, depending on circumstances and whether or not it is used or is suitable for use in connection with navigation (*Att.-Gen. for Dominion of Canada v. Att.-Gen. for Ontario*, 1898, A.C. 700).

Where the title is not limited by the water's edge, and it extends beyond to the middle of the stream or lake, the boundary is sometimes referred to as "the middle thread." The middle thread is the line midway between the edges of the water at normal stages when it is neither swollen by floods nor shrunk by drought (*Trustees v. Dickinson*, 9 Cush. 544).

The particular questions which led to this paper concerned erosion and accretion. The Dominion Lands Manual (Sec. 135) gives a very clear statement of the general rule. It says, "Where the land is slowly and imperceptibly added to, either by alluvion or by the recession of the water of a river or lake, whether navigable or not, the new land thus formed belongs to the riparian owner in front of whose land it is formed, and the process is held to be imperceptible where its effects are so gradual that it is not discernible from moment to moment, though the fact that there had been an increase in the land may be perceptible from year to year, or at shorter intervals. The converse is also true, that lands gradually encroached

upon by the water upon which they border cease to the extent of the encroachment, to belong to the former owner.

“On the other hand, sudden and sensible additions to or subtractions from lands, arising from similar causes, do not cause any change in ownership.”

The benefit of gradual accretion or the loss from gradual erosion holds even though it be caused or aided by artificial means, except in cases where the works have been constructed for the purpose of causing the change of water line. The rule as to accretion applies where the land is bounded by the water, although it is described in the conveyance by specific measurement or delineation on a plan, but it does not apply where the land as originally granted was not in fact bounded by the water but was separated therefrom by other land (Armour on Real Property, page 351).

A lot on the north side of the Talbot Road was encroached upon by Lake Erie. It was held that as the owner could gain no land by accretion, alluvion or other causes, owing to the presence of the road, he should not lose by encroachment of the water upon his land to which fixed termini were assigned by the grant from the Crown (*Volcanic Oil v. Chaplin*, 1912, 27 O.L.R. 34).

I believe that though the water boundary of a parcel changes with the erosion or accretion at the shore or bank, boundaries dependent upon the shore or bank for their initial location do not change once they have been established, but are fixed from the position of the shore or bank at the time of the grant to which they owe their origin.

I cannot find a ruling by the Canadian courts saying in what direction the side limits of lots should be extended across accretions. In a case in the United States, it was held that the total length of frontage held by the owners on the original bank of a river should be compared with the total new frontage available, and the new frontage divided proportionately. Unless an obvious injustice were being done, it would seem consistent with the procedure adopted in other circumstances, e.g., closing a highway, and the general procedure adopted granting water lots, to produce the side limits to the water's edge. If, however, the side limit were at an acute angle with the shore, it is obvious that following this method a comparatively small accretion might cut an owner off from the water entirely. In such circumstances a production evidently would not be the proper boundary.

In *Yukon Gold v. Boyle*, argued before the British Columbia Court of Appeal, dealing with erosion on the Yukon River, it was established by evidence that erosion amounting to approximately 25 feet took place each year at the time of the spring floods and that the soil could be actually seen crumbling away. It was held that this was not imperceptible erosion, and that the title to the land could not follow the shifting of the bank. There is still, apparently, some uncertainty as to the amount of information needed and the character of the description required to fix a water boundary. Armour says, "Where the land was originally bounded by the water, and accretions have occurred, then if the limits between the original shore and the accretion can be determined and the exact space between the limits and the new water mark can be defined, the accretion does not belong to the riparian owner." Halsbury says, "The whole doctrine of accretion is based on the theory that from day to day, from week to week, and month by month, a man cannot see where the old boundary was, and that which cannot be perceived in its progress is taken to be as if it never had existed at all," and again, "where the boundaries of the land are well known and defined, no change occurs in the ownership of the land or foreshore." On the other hand, Gould says, "The rule (regarding accretion) is the same when the old boundaries are not known and when they can be ascertained. But when the line along the shore is clearly and originally fixed by a deed or survey, it will not, it seems, be changed because of accretion, although as a rule the right to alluvion passes as a riparian right" (Gould on Waters, 3rd Edition, Sec. 155).

Every Ontario Land Surveyor in passing his final examinations is questioned on the various acts governing methods of determining and establishing boundaries of parcels of land. The Survey Act, Land Titles Act, and Registry Act must be studied as far as they affect his duties, as must the Municipal Act. The Dominion Lands Manual goes further and gives instruction on certain points not covered by specific legislation. Beyond the rules laid down by such legislation in this country are the Common Law and the Statutes of Great Britain, up to the time of the passing of the British North America Act. Upon these the Board does not question the student, and probably wisely. It seems to me, however, that the practising surveyor should, as far as possible, supplement his knowledge of specific acts by a knowledge of the broader law so that he

may carry out his duties with greater efficiency, and in this I do not mean that he should encroach upon the sphere of the legal profession. There is sometimes room for argument as to the meaning of the law regarding certain points covered by the acts, and the surveyor can only perform his duties by following the method he conceives to be right, and if necessary warning the client as to a possible contrary interpretation. Similarly there are constantly arising problems not specifically covered by the acts, and which he must solve. He should by all means refer all doubtful points to the legal adviser of the client, but he will be in a much stronger position if he has at least a good general knowledge of the laws governing the solution of his problem.

REFORESTATION PROBLEMS AS I SEE THEM IN NORTHERN ONTARIO.

By E. W. Neelands, O.L.S.

NORTHERN Ontario, with 330,000 square miles of unknown wealth, constitutes over 80 per cent. of the total area of Ontario, but has a population of only 1.4 persons per square mile, as compared with 28 in Southern Ontario.

Considerable knowledge of this land was acquired during the location and construction of the Canadian Pacific Railway, some of our oldest members having been employed on exploration and construction work. Since that time we have been rapidly moving north, mapping out the country from east to west, until the advance meridian lines have reached our northern limits.

Four Distinct Areas

For the purpose of this paper the writer will divide Northern Ontario into four distinct areas or belts, running from east to west in the order in which they became known to us.

(1) We have that portion, roughly speaking, south of a line through Rainy River, Nipigon and Englehart, with an approximate area of 55,000 square miles. This land, for the most part, is rough and rugged, falling rapidly south, well timbered once with white, red and banksian pine, together with mixed timber characteristic of this section, and watered with countless lakes and turbulent rivers of unsurpassed beauty. This is the tourists' and hunters' paradise; the home of the lumberjack, the source of much hydro power, where the silver, nickel and iron is found, the first treasure house of the Ontario Government.

(2) A parallel area 60 miles in width and over 700 miles from east to west, sloping more gently north and south from the height of land. This is a land of narrow rock ridges and valleys, a land of sand hills and plains, swamps and muskegs, shallow lakes and crooked streams, covered with a lighter blanket of forest growth of many types and ages, due to frequent fires of great magnitude during the last 100 years. The rocks, too, bear the marks of terrific heat and rupture, and to-day, although they are scratched by the hand of man,

we have positive proof that under their swamps and rolling hills, under their narrow rock ridges and valleys lie the greatest gold ores on earth. Surely this belt can rightly be called the golden summit of Ontario.

(3) The great clay belt, approximately 100 miles in width, immediately north of the Golden Summit, and traversed by the Canadian National Railway, is blessed with good drainage, heavy stands of black and white spruce and water powers of great importance. From these we obtain power to manufacture wood products and extract the riches from our rocks. All surplus power will later be employed in operating elevators and flour mills.

(4) Beyond the future granary of the north lies the coastal plain, a vast tract of swamps and muskegs, thinly forested with scrub spruce, poplar or jack pine along the banks of lakes and streams. Although it has a cold and forbidding exterior, its rocks may yet produce iron, coal and oil.

Forest Reserves Becoming Depleted.

From surveys made by the Ontario Forestry Department in the Clay Belt, 1921-22, and from an intimate knowledge of the country, I estimate a possible 100 million cords of black and white spruce in the great clay belt that can be profitably marketed.

Over the 42,000 square miles of the Golden Summit probably 50 million cords, including undersized jack pine, can be obtained, together with a few stands of red, white and jack pine, which are rapidly disappearing by fire, or for tie timber. Between the Golden Summit and the French River another 50 million cords of spruce pulp is widely scattered among mixed timber, with occasional stands of red and white pine, estimated by E. T. Zavitz, Provincial Forester, at 10 billion feet, growing in Quetico Park, Lake of the Woods watershed, Lake Huron watershed, Missinagi and Temagami forest reserves. He also estimates that at the present rate of consumption we have enough to last only 25 or 30 years. Fifty producing lumber mills in Northern Ontario, with a capital investment of \$23,450,000, and an annual outlay in expenses, salaries, fuel consumption, etc., of \$11,287,926, turn out 50,000,000 feet B.M. per annum, or one-third of the total for Ontario; and eight pulp and paper mills, with a capital investment of \$70,960,500 and an annual outlay in materials purchased, wages, etc., of \$24,075,046, produced in 1921

319,119 tons of pulp and 277,949 tons of paper, valued at \$44,229,061, or 58.7 per cent. of the wood pulp produced for Ontario.

The wood manufactured on the ground, the millions of feet driven down our southern rivers to feed the hungry mouths of mills on the Ottawa River and Great Lakes, together with quantities shipped from freehold land to the United States is rapidly depleting our forests. Added to this the waste from fire is twenty townships a year, and I venture to say nearly the equivalent from armies of insects and diseases peculiar to our native trees.

Within a very few years practically all the balsam in Temiskaming and Western Quebec will be dead, and with them many spruce affected by the same disease, but more often the spruce gall or bud worm.

Far be it from me to paint scenes of desolation, but may I not refresh the memory of members of our Association, many of whom know the country better or as well as I, who are in a better position, or more qualified to assist our Government and the Forestry Branch under the able direction of E. T. Zavitz?

Planting New Forests

Would not our Lands and Forests Department be well advised to call in the services of our Association in assisting the Forestry Department save the accessible virgin timber we have, protect the second growth started and plant out new forests.

Using the estimate of E. T. Zavitz to make Ontario pine perpetual, we require five new forest nurseries planting 10,000 acres annually.

First cost of nurseries	\$100,000
Annual maintenance	\$ 50,000
Annual cost of planting 10,000 acres	\$150,000

Profit to Province

At the end of sixty years an annual production from above plantation of 400 million board feet of lumber or 50 million more than we now cut.

Ontario is now depleting her capital stock at the rate of at least \$1,000,000 per annum. Why not get this amount transferred to credit of revenue as soon as possible?

In Sweden the state, in recognition of the economic factors involved, undertakes the responsibility of insuring perpetuation of her forests and annually returns to the forests 50 per cent. of the profits derived therefrom. Ontario returns 25 per cent. or less.

It may be said that the position of Sweden as an independent nation and as a civilized country is contingent upon the existence or non-existence of her forests.

At this session of Parliament, funds should be voted to commence at once a classification or stock-taking of our northern lands. In other words, the amount of agricultural land that should be used for that purpose only, the amount of sand, muskeg and barren land. Having arrived at the portion left suitable for tree planting, keep a sufficient organization employed the year round cutting isolated patches of mature timber, clearing by fire at proper time all remaining slash or dead timber and its army of wood destroyers, protect seed trees where advisable and plant out new seedlings where no seed trees exist. Co-operate with the settler in helping clean up any fire menace, and above all things get rid of our so-called black muck, even if by fire. We cannot expect to grow new forests when patches of slash or dry muck are left scattered throughout.

Serious Fire Losses

The October fire, 1922, swept from Englehart to North Cobalt, from Elk Lake into Quebec, destroying the buildings of over 500 settlers, several hamlets, two towns and thousands of acres of second growth, because of small patches of slash and black muck. The immediate and generous assistance given the fire sufferers by the people of Southern Ontario, individually, as companies, societies, municipalities and by the Government, would easily do what I suggest. We have other large areas that will go the same way unless methods are changed. Co-operation and recognition of services rendered, backed up by rigid enforcement of sane laws, are necessary to get the desired result.

Where spruce once predominated, now 90 per cent. of second growth is poplar, the balance spruce, balsam or birch. Why is this? I have had under close observation for thirteen years an area of 600 acres on which no aspen poplar grew, but black or white spruce, balsam, poplar and birch. Five hundred acres were burned over in 1912; several ground fires

have occurred since; one hundred acres have been ploughed; one hundred acres are under grass ready for the plough; one hundred acres have been burned clean and have now a crop of second growth from one to seven years old; two hundred acres are slash, and the balance green black spruce. The second growth spruce are all within 1,000 feet of seed trees. No birch are growing because no seed trees were left, but poplar grows wherever the muck has been burned away, as the seed carries for miles. A settler must have trees to make fences, construct homes and outbuildings, to shelter his grain and hay, feed cattle to keep up the fertility of the soil. He must have trees for a wind break. The pulp mills and the towns they support must have wood food. Take the Abitibi Power & Paper Company, for instance, with a yearly consumption of 200,000 cords, or one and a half townships, using 300 tons of coal per day besides 45,000 electrical horse power, supplying over half the freight to the Temiskaming and Northern Ontario Railway, employing 1,100 men in the mill, 2,000 in Winter in the bush, with an annual payroll of \$3,000,000. Lack of trees will shut down this mill; will seriously affect the precipitation and conservation of same and hence the available horsepower. To what other use could slashing mills, conveyors, stackers, grinders, digestors, acid and bleaching tanks, paper machines, etc., be employed?

Work of Forestry Branch

The Forestry Branch in 1922 made a combined area and ground survey in Northern Ontario. The first area covered 13,500 square miles of the lower watersheds of the Abitibi, Mattagami, and Moose Rivers. Another large area of 4,000 square miles in extent, forming a portion of the upper watershed of the Missenabie and Kapuskasing Rivers in like manner, a full and interesting report of which is found in 1922 report of the Department of Lands and Forests, and should be read by every member of the Association. May this class of work be continued with all speed so that we may know as quickly as possible what we have and what will be necessary to do.

Provincial Forest plantations have been started at Orono, Midhurst, Simcoe Co., and Band Banks, and demonstration plots in the counties of Brant, Durham, Huron, Simcoe, Norfolk, Grenville, Northumberland and Russell. Seedlings were also supplied to 311 private individuals for planting in waste

places, the demand being greater than the supply. I would like to see this work, well begun, extended into Northern Ontario, and more publicity given to the work. The geological maps and literature supplies and the practical lectures on geology and mineralogy given have produced hundreds of highly trained prospectors who now have more good propositions to offer than there is capital to develop. Most all ventures by mining companies are now fairly sure.

A similar class of maps of our various soils, and lectures on tree culture, the value and absolute necessity of same, will have like results.

I planted in 1912, three soft maples, now 6 in. to 9 in. diameter; in 1913, over 200 white spruce, now 10 to 15 ft. high; 1915, 30 white cedar, all doing well; 1916, 5 paper birch, now 4 to 5 in. diameter.

These trees afford a splendid windbreak and last Summer, due to said shelter, my family had all the green corn they could use for six weeks, whereas others who generally grew better corn in warm Summers were not nearly so successful.

The Horticultural Society of New Liskeard had a tree-planting day last Spring, when over 500 trees were planted, over 90 per cent. growing. An idea prevails that only certain trees will grow in Northern Ontario. In Wabi and Sutton Bays, Lake Temiskaming, also near Thornloe, we have oak up to 3 feet in diameter, elm up to 18 in. diameter, far north of the height of land, and soft maple from which we made syrup, six miles north of the height of land in McNeil Township. I have estimated young stands of aspen poplar 20 to 25 years old that would produce as many cords per acre. I have demonstrated thirty years ago that a farmer can plant trees and grow fence posts with less initial cost than by boring holes and putting in cedar, and instead of rotting or heaving, requiring replacing, he has a stronger post every year and shelter and beauty besides.

If each farmer in Northern Ontario who has proper fire protection would plant out 25 to 30 acres of poplar, birch, maple, oak, spruce and tamarac or pine, if some of his land was suitable, in 20 years he would have sufficient for annual requirements on his farm.

The average value per acre in fuel, small timber for various uses, protection from sun and wind, etc., would at least

equal the value of any acre of tilled land on his farm. The above statement can be vouched for by thousands of farmers in Southern Ontario.

I have been a lover of trees all my life, but due to business pressure along other lines, have not made a scientific study of same. It is therefore impossible for me to do the subject of reforestation justice, and in closing I submit a few verses which crudely express the land as I see it and know it, and my hopes for the future.

THE CALL OF THE NORTH

I have lived in this land of promise,
For twenty happy years;
Doing things just for the love of it,
Without either pain or fears.

I have slept in the lap of its forests,
Dreaming of greatness in store;
Or shot its many rapids,
Amid the wrath and roar.

I have paddled and packed with red men,
Marking out farms and mines,
Or gauging the power of water
Flowing through spruce and pine.

Three railroads I've seen a-building,
And towns along them grow;
With well-tilled land on either hand,
And meadows all aglow.

I've helped to build the pulp mills,
That feed on the green spruce tree,
From which is made the paper,
Spreading news to you and me.

With mining men I've travelled oft,
Cheered by their hope and mirth;
And seen the gold and silver
From the grass to the bowels of the earth.

I love the snow, its cold, its warm,
Its bridges, swamp and lake;
It helps the farmer and lumberjack
Make a little stake.

But I dread the fire that gains control,
That sweeps our northern lands,
Leaving death and homeless people
And blackened timber stands.

I fear the day of wind swept plains,
When the trees may all be gone,
The mills closed down and paper none,
How shall we then atone?

In spring our streams with mighty roar
Will rush into the sea,
Then disappear just twice a year
And give no 'lectricity.

The miner will have neither lagging nor stull
To stope the treasurers in place;
Will he use sky hooks or muscilage?
When cutting a second face?

What need of the farmer to till the soil
And grow the turnip and spud,
When all the miners and lumbermen
Have gone to another world?

It must not be, I cannot see
A land without a pine.
I'll teach and preach, I'll plant and grow
Twixt every township line.

I'll fight the fire, the worm, the rust,
With all my might and main;
The day will come, the mills will hum;
The trees are back again.

I was born with the Redmen among the pine,
In the forest I've lived since birth;
I want to keep this northern steep,
The sweetest place on earth.

And when the shadows of evening fall,
With neither a rustle nor sound,
I'll rest my head on a balsam bed,
In the Happy Hunting Ground.

DISCUSSION

The Chairman—I have known Mr. Neelands for a great many years, and have known his very fine qualities. There is a very great deal of value in that paper, and the tragedy of the war in Europe has drawn to our attention the great need for fire control and conservation. The Haileybury fire was a result of lack of that control, and no doubt a great lesson has been learned from that. I would like to see a number of the members discuss the points Mr. Neeland has thrown out in his paper. I may say my own feeling about the whole matter of forest fire control is that the fire control has been organized and working under the wrong basis. They are organized along the line of putting out fires, rather than controlling them. Their real object is, as soon as the fire starts to put it out, and I think Mr. Neelands and others who know the north country know that the north country will never be cleared and populated without fire. It is too expensive a proposition to clear the land except by fire, and my personal opinion is, our present Government should reorganize the policy of their Fire-ranging Department so that these men would be trained to set fires at the proper time and proper place, and be authorized to call on the community to control the fires. That would prevent widespread conflagration, because the dangerous slash would be cleaned up when the weather was right and the wind was right.

Mr. McCubbin—I took a great deal of pleasure and interest in Mr. Neelands' paper. I think there is a great deal more in the paper than professional interest. We have had discussed in the Association various complicated and technical matters, and it has been the consensus of opinion of the members of our Association that the reason we do not get more publicity for our meetings was because we do not get the human interest. I do not think we have had anything for a long time that has had as much human interest as the paper that has just been read, and if the latter part of the paper is not printed in tomorrow's dailies, at any rate, I should say some of our committees are falling down on their job. I have much pleasure in moving the paper be received and printed.

Mr. Aylsworth—I think we will all agree this is a very burning question. Every association and public body talks about reforestation and saving the weeds. Last Winter I

was down at the meeting of the Dominion Land Surveyors, and Mr. Black (I think he was Secretary of the Pulpwood Association) read a paper, and we had representatives of the Dominion Land Surveyors from British Columbia and all over, and this gentleman read a paper, and I have never forgotten it. He dealt with this very matter regarding fire ravages, and the policy of extinguishment, on a broad line. I for one have read a great deal about this question. The Dominion Government has taken the question up and the Ontario Government has.

Mr. Neelands did not suggest any remedies except for the individual farmer, or each one to do his mite along that line, and that is the only way to get anything done. That is one of our enemies today. We are asking the Government to fight away and we think they are doing their best now. They have had experience along these lines—a good deal of experience. Mr. Neelands did not suggest any remedies, but perhaps that could be discussed more fully. There is no doubt that our lumber, our pine and maple and spruce are gradually becoming extinct, and in a few years—it may be a good thing for us old fellows that we will be out of here, but in a few years what are the generations that are to come going to do about this question?

One could talk all night on this subject, but Mr. McCubbin has taken the words out of my mouth, and I had not very much to say. We have had a great many societies suggest remedies, but the whole thing is that we have not had sufficient publicity. The paper that has just been read I think has been one of the most arresting papers we have had read before the Association for a great many years. It has got to get to the public mind and public observation, and I think it is a question for the members of this Association to take an interest and start something towards getting this subject before the public. We could get it before the public, and there is no class of men in the Province of Ontario who are so qualified to speak on the subject of our forests becoming destroyed. No class of professional men are as capable of speaking as we are, and I think a few words from them will have more effect than any organization in Ontario.

I think this should be the first step, to see that more publicity is directed along these lines. I suggest that this Association take this up and get in touch with the authorities. I

would also suggest that Mr. Neelands' paper be given full publicity; that it be supplied to the papers, and that the papers be made to publish them.

Mr. Pierce—Mr. Neelands and the speakers who followed have so completely covered the subject that I am afraid there is not a great deal left for those following after to say. There is one feature in connection with that that has not been covered, and that is the Canadian exports. The first in order of value is our crop exports, and the second is our timber products. Timber products stand second in value of all the exports of the Dominion. It is apparent, therefore, what our forests mean to Canada, and Mr. Neelands has pointed out what has actually taken place, and the probability or the certainty within a very few years that we are not going to have that commodity. There are two features, two possible lines of action by which the situation might be approached; one is the prevention of fire and control of the cutting of the forests. Now Mr. Neelands put out one point, and that was in connection with the Haileybury fire. I refer to the fire relief in the northern country, the amount of money that was contributed all over the country for the relief of the sufferers. What would have happened if that amount had been expended before the fire towards a system of preventing these fires? The situation, when that is brought to the attention of the Legislature, is that it is going to require a tremendous outlay of capital, but we now have an asset that must be insured, and this outlay could be considered in the nature of insurance and certainly after a fire has taken place and such a tremendous amount of money is necessary for the relief of sufferers it does not seem fair that a policy which would reverse the situation should not be followed.

There is another situation that will arise if our forests are depleted: We will, of course, be without revenue from the forests, and the next step is the result it will have on our agricultural lands. We have only to look at what has taken place. There are certain parts of China where they have no crops, and today they are barren, and there is no probability of their becoming any value simply because forest fires came and burned up all the trees, and if that should take place in a certain part of Canada our country will be similar to those areas in China and other places in the world, and it is up to us now to take precautions towards looking after our forests, not only in the interests of pulp products, but in the interests of our agriculture.

Mr. Reuben—We all realize how serious the situation is. You go up some of the main streets of the city and look in the different furniture stores, and see furniture made of wood, mahogany, for instance. Only a few years ago it was used for fences and in building houses. When mahogany became short there was only sufficient to make furniture. That is what might happen if our timber is allowed to go without some effort being made towards bringing the timber back as it was before.

Mr. Dobie—Mr. President, I am sure it gives me a great deal of pleasure to say a word or two in connection with this Association. I enjoyed very much the paper by Mr. Neelands, and also the remarks of the different speakers who preceded me. It strikes me that this is a very great subject, and one that has not had sufficient attention given it. It is a subject with me that gives me a great deal of pleasure to talk about, and I have always taken every opportunity to say a word in connection with it. I do not think people realize to what extent we are depending upon forest resources. When you come to consider about fifty per cent. of the manufacturing industries are depending in some way or another upon forest resources, we begin to have an idea of the importance of the matter. To my mind this fire protection is vital—when you go through the north country and see the immensity of it, and I am afraid I cannot speak along these lines with the same intelligence as Mr. Neelands, but I believe the only solution is that only by personal endeavour and by co-operation between governments and municipalities can anything be done. A lot is being done in old Ontario. And it can be done in new Ontario. Nothing is going to be done unless a great attempt is made in arresting this thing. I do not think our efforts are going to get anywhere unless everybody takes an interest, and can be made to see the seriousness of the situation. If we cannot find some means of prevention these fires are going to keep on. Last year about 350,000,000 feet was cut out for pulpwood and lumbering material. Men who are in a position to know say that for every tree that is cut down by lumbermen about ten are destroyed by fire. I know in one year, I think about four or five years ago, in the district lying north of Lake Huron, there was an area burned over of 500,000 acres; that is an area of land six miles long and six miles wide. Last year was the worst they had in years; there was never anything like that. When we realize

this occurs every succeeding year we can make a rough calculation of the terrible destruction that is being made to our forests. They have in the Forestry Department a file showing in one area in Southern Ontario years ago something like 85,000 acres was burned over.

You cannot stop fires; you can talk about it as much as you like. You can establish a Fire Ranging Service, but they can do nothing unless they are working along the proper lines. People do not realize the danger. There is not much use in starting out and getting a second growth of timber if another fire is coming along cleaning that out.

I would like to see every man that goes out of this room go into the particular section where he lives and do missionary work warning the people against the carelessness which is usually the cause of these fires. Help educate the people to the necessity of assisting the Government in authorizing whatever expenditures are necessary to organize the Fire Ranging Service to the highest possible efficiency. I think they are doing all they can; the Government are doing a great deal towards educating the people.

I must congratulate Mr. Neelands upon his paper.

The Secretary—Is there any further discussion?

Mr. McKay—I do not know whether any of the members saw last week's Saturday Night. There was an article in which it speaks of land that was absolutely barren which had been swept by fire, but now, today, it is one of the most beautiful crops in the country.

Mr. Neelands himself is setting a good example which everybody can follow. It is astonishing what can be done in a very short time.

Mr. Anderson—I was very much interested in Mr. Neelands' reference, in his paper, to the elm on the Metagami River. Last year I happened to run across this stand of elm. They are good sized trees though the area was not large. I had not heard of them being there before, and wondered if the members of the Association knew of other stands of elm in the far north country, and I began to wonder how the elm got there. As far as I know there was not any elm within a hundred miles, yet these old trees were standing there, and if there are any members who know of other places where there are elms to be found in the north country I would be interested to know.

Mr. McGeorge—Everybody can ask conundrums about forests. I was surveying a line down on Lake Winnipeg and there I found mountain ash. The same trees were there that grew in the tropical countries, away out in the wilderness; nobody lived there and nobody cut there. I do not think you would find them in any other parts of Ontario. They were away out in the land around Lake Winnipeg, and I asked a question of the Chief of the Forestry Department, and from every other man I thought would be an authority, and nobody can answer these conundrums. I was very much surprised to hear that elm trees grew up so far north as Mr. Neelands said they did. I was on a survey on the north boundary of Lorraine, away back in 1886, and I remember we struck a few maple trees north of Lorraine; I do not remember any elm and soft maple, but where maples will grow there are wonderful possibilities for reforestation.

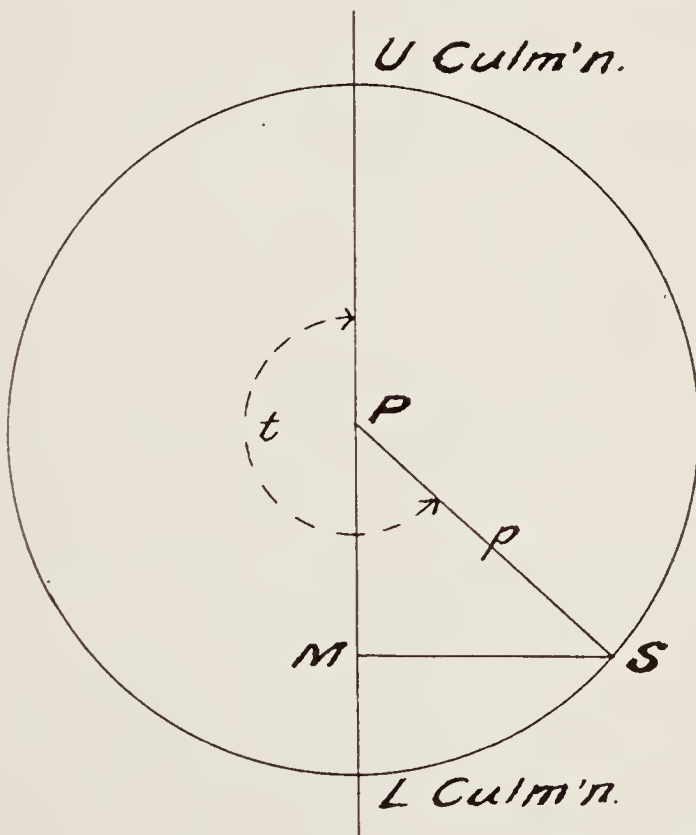
The President—I think your paper, Mr. Neelands, has brought out a lot of comment and interest. I presume Mr. McCubbin moved some time ago that the paper be received and printed in the minutes.

A SIMPLE FORM FOR THE AZIMUTH EQUATION

BY "the azimuth equation" is here meant the equation used in reducing an observation of Polaris to determine the azimuth of a direction, the observation being taken at any time. Any observer who has taken such an observation by daylight would never from choice observe at night, the advantages of daylight observations being so obvious. One difficulty, however, experienced in observing at that time, is that of finding the star, or bringing it into the field of the telescope of the transit; the writer has frequently found the following method useful:

Finding Star in Daylight

Compute the sidereal time corresponding to the time at which the observation is to begin, if not provided with a



sidereal watch, and then find the hour angle of the star by means of the formula:

$$t = \Theta - \alpha, \quad (1)$$

in which t denotes the hour angle, Θ the sidereal time, and α the right ascension of the star. Then draw a circle, as shown in the figure representing the diurnal circle of the star as it would appear from the earth, and set off the hour angle, here assumed to be about 15 hours. P is then the pole and S the star, PS representing the polar distance. Draw SM perpendicular to the meridian and then solve the triangle PSM as a plane triangle, using as data the polar distance of the star, to the nearest minute, and the angle t ; thus

$$PM = p \cos t,$$

$$SM = p \sin t,$$

and natural functions to two decimal places may be used. Then the altitude and azimuth of the star are, approximately

$$h = \phi + PM = \phi + p \cos t,$$

$$A = 90^\circ - SM \sec h = 90^\circ - p \sin t \sec h, \quad (2)$$

ϕ denoting the latitude. By setting off on the vertical circle the altitude thus found, turning the instrument in azimuth towards the north by the aid of the compass needle, the star is soon brought into the field of the telescope. It is then bisected, and the H.C.R. noted.

The observation for azimuth is then taken according to the usual scheme as follows:

Point telescope to the reference point, with circle right, and note H.C.R.; then

Point to the star, with circle right, and note time and H.C.R.; then

Reverse instrument, point to the star again, with circle left, and note time and H.C.R.; then

Point to the reference point, with circle left, and note H.C.R.

It is assumed that the horizontal circle remains clamped throughout the observation.

Determination of Sidereal Time

It is now necessary to determine the sidereal time with sufficient accuracy for finding the hour angle corresponding to the mean of the above observed times, to be used in the reduction of the observations. This may be done by making use of the approximate azimuth, computed by equation (2), combined with the H.C.R. on first pointing to the star, to bring the instrument, pretty closely, into the meridian. If

the watch time of transit of an equatorial star is then observed, its right ascension is the corresponding sidereal time. The sidereal time corresponding to any other watch time then readily follows, and hence the hour angle of Polaris for the reduction of the azimuth observations.

In reducing the observations the formula almost universally used is the following:

$$\tan A = \frac{\sec \phi \tan p \sin t}{1 - \tan \phi \tan p \cos t} \quad (3)$$

This formula is inconvenient, on account of the form of the denominator, unless subtraction logarithms are available, or a special table giving the value of

$$\log \frac{1}{1 - a}$$

in terms of $\log a$, where

$$a = \tan \phi \tan p \cos t$$

Such a table is given in Special Publication No. 14 of the U. S. Coast and Geodetic Survey, pp. 165 to 173.

In order to avoid the necessity for a special table the above equation, placed in a different form, may be used. Thus, writing equation (3) in the form

$$\tan A = \frac{\tan A'}{1 - m}$$

in which

$$\begin{aligned} \tan A' &= \sec \phi \tan p \sin t, \\ m &= \tan \phi \tan p \cos t, \end{aligned}$$

and taking logarithms and expanding, it becomes

$$\begin{aligned} \log \tan A &= \log \tan A' - \log (1 - m) \\ &= \log \tan A' + u m + \frac{1}{2} u m^2 + \\ &\quad \frac{1}{3} u m^3 +, \end{aligned}$$

u denoting the modulus of the common system of logarithms. Introducing the value of $\tan A'$ into the expression for m we have finally the following equations for determining A :

$$\begin{aligned} \tan A' &= \sec \phi \tan p \sin t \\ m &= \tan A' \sin \phi \cos t \\ \log \tan A &= \log \tan A' + u m + \frac{1}{2} u m^2 + \\ \log u &= T.6377843. \end{aligned} \quad (4)$$

This series for computing A is very convergent. Thus, if a value of A , correct to about $1''$, is sufficiently close, it is

only necessary to use two terms, omitting that containing m^2 , and five-place logarithms; the inclusion of the term in m^2 , and six-place logarithms, will give A to about $0''.01$.

In carrying out the computations as above indicated the writer always found that the value of the azimuth given by equation (2) agreed very closely with that given by (3) or (4). An investigation was therefore made as follows, to ascertain whether this agreement was accidental, or if the simpler formula may be used for the final computation of the azimuth if the highest precision is not necessary.

The rigorous form of equation (2) is

$$\sin A = \sin p \sin t \sec h,$$

which may be written

$$A = \sin^{-1} (\sin p \sin t \sec h).$$

Expanding, this becomes

$$A = \left(p - \frac{p^3}{6}\right) \sin t \sec h + \frac{p^3}{6} \sin^3 t \sec^3 h,$$

(omitting powers of p above the third)

$$= p \sin t \sec h + \frac{p^3}{6} \sin^3 t \sec^3 h \left(1 - \frac{1}{\sin^2 t \sec^2 h}\right);$$

$$\text{or} \quad A = A' + \frac{\sin^2 1''}{6} A'^3 \left(1 - \frac{p^3}{A'^2}\right) \quad (5)$$

$$\text{in which} \quad A' = p \sin t \sec h \quad (6)$$

$$\left(\log \frac{\sin^2 1''}{6} = 12.5929985\right)$$

A' is here the approximate azimuth given by equation (2); and equation (5) contains a term by which a correction to this approximate value may be computed. In the numerical example given below this corrective term amounts to but $0''.307$ and that this is very near the truth is shown by the close agreement between the value of A given by (5) and that given by the practically rigorous formula (4). The omitted terms in (5) are therefore unimportant.

A further examination of (5) is necessary, however, in order to be sure that the corrective term does not become excessive for other values of the azimuth. It evidently vanishes when $A' = p$, is negative when $A' < p$, and positive when $A' > p$. Also it may be shown, by a process that need

not be given here, that it has its maximum negative value when

$$A' = + \frac{p}{\sqrt{3}}$$

so that the maximum negative value is

$$- \frac{\sin^2 1''}{3^{5/2}} p^3$$

which, for the numerical example, is

$$- 0''.099$$

Also the maximum positive value occurs when A' attains its maximum at elongation. In that case

$$\sin t \sec h = \sec \phi,$$

so that

$$A' = p \sec \phi,$$

and the corrective term becomes

$$\frac{\sin^2 1''}{6} p^3 \sec^3 \phi \sin^2 \phi.$$

Using the data of the example below this is found to be

$$0''.564.$$

Its value, however, evidently increases with the latitude. In latitude 60 degs. it becomes

$$1''.550.$$

It appears then from this investigation that the simple formula (2) or (6) fulfils all requirements when the observer is provided with the ordinary transit, reading at best—we will say—to 10''.

The question that now presents itself is: Why not observe the altitude of the star, while taking the observation, by reading the vertical circle at each pointing to the star and thus dispense with a knowledge of the latitude, further than is necessary in order to find the star. This raises the question of the possible error thus introduced into the azimuth due to the error in the observed altitude. It may be shown, however, on the other hand, that if the observer is obliged to depend upon his instrument to determine his latitude an equal error may be caused in that way. For, taking the equation

$$\sin A = \frac{\sin p \sin t}{\cos h}$$

we find by differentiation and a little reduction

$$dA = \tan A \tan h \, dh, \quad (7)$$

which gives the error dA in the azimuth due to the error dh in the altitude. Again, taking the equation

$$\sin t \cot A = \cos \phi \cot p - \sin \phi \cos t,$$

we now find by differentiation, and reduction, ϕ being the independent variable,

$$dA = \sin A \tan h \, d\phi \quad (8)$$

As A is small the values of dA given by (7) and (8) are nearly identical; with the data of the example below, and assuming $dh = d\phi = 20''$, they are, respectively

$$0.''6238 \text{ and } 0.''6236;$$

thus showing conclusively that, as far as the observation of the altitude is concerned, the use of the simple equation (6) will give as close results as a rigorous formula, unless the observer has a more precise knowledge of his latitude than his instrument will give.

The following example of an azimuth observation, taken on September 3, 1920, in the interior of Anticosti Island, will serve to illustrate the use of some of the above formulae. The observation was as follows:

Object obsd.	Cir.	H.C.R.	V.C.R.	Watch p.m. h m s
R. P.	R.	185° 22.5		
Polaris	R.	116 14	(49° 21')	6 09 39
Polaris	L.	296 18	(49 21)	6 13 11
R. P.	L.	5 23		

The vertical circle was not actually read, the readings given above being computed from the data to the nearest minute, to be used to illustrate equation (6).

The data were:

$$\phi = 49^\circ 52' 07'',$$

$$\lambda = 4^h 16^m 41^s,$$

(as found by scaling from a map),

$$\alpha = 1^h 33^m 16^s,$$

$$d = 88^\circ 52' 40'', \text{ (therefore } p = 4040''),$$

taken from the Nautical Almanac. The meridian transit of the star η Serpentis was observed at the watch time 6 hr. 43 m. 30 s., the right ascension of the star and therefore the sidereal time of its transit, being 18 hr. 17 min. 14 sec., from which we find the hour angle of Polaris, at the mean of the above observed times, to be 16 hr., 11 min., 48 sec.; therefore

the hour angle, reckoned towards the east, is 7 hr., 48 min., 12 sec. = $117^{\circ} 03' 00''$.

The azimuth will now be computed by means of equations (4) and (5), using seven-place logarithms in order to bring out the close agreement between the values given by those equations, and thus show that no important term has been omitted in deriving (5)

Equation (4)—

	Log	
sec ϕ	0.1907484	
tan p	8.2920118	
sin t	9.9496876	
<hr/>		
tan A'	8.4324478	8.4324478
sin ϕ	9.8834164	
cot t	9.7081022 ⁿ	
<hr/>		
m	8.0239664 ⁿ	
u	1.6377843	
um	3.6617507 ⁿ	—0.0045893,45
<hr/>		
m ²	4.0479328	
$\frac{1}{2}$ u	1.3367543	
$\frac{1}{2}$ um ²	5.3846871	0.0000242,49
<hr/>		
m ³	6.07190 ⁿ	
$\frac{1}{3}$ u	1.16066	
$\frac{1}{3}$ um ³	7.23256 ⁿ	—0.0000001,71
<hr/>		
tan A	8.4278825
A = $1^{\circ} 32' 03''.366$		
<hr/>		

Equation (5)—

	Log
p	3.6063814
sin t	9.9496876
sec h (= $49^{\circ} 21' 53''.04$)	0.1861108
<hr/>	

A'	$= 5523''.061$	3.7421798
A'^3		11.2265394
$\sin^2 1''/6$		12.5929985
	0.65999	1.8195379
$\sin^2 t \sec^2 h$		0.2715968
	0.35314	1.5479411
	<u>0.30685</u>	
A	$= 5523''.368$	
	$= 1^\circ 32' 03''.368$	

The azimuth will now be computed by means of equation (6), showing the precision of the value given by that simple equation.

Equation (6)

	Log
p	3.60638
$\sin t$	9.94969
$\sec h$	0.18613
A	<u>3.74220</u>
A	$= 5523''.3$
	$= 1^\circ 32' 03''.3$

It is to be noted, however, that this close agreement with the former values is partly accidental, resulting from the use of h to the nearest minute.

The azimuth of the reference point is now found as follows:

Azimuth of star	$= 1^\circ 32' 03''$
H. C. R. on R. P.	$= 185 \quad 22 \quad 45$
Sum	$= 186 \quad 54 \quad 48$
H. C. R. on star	$= 116 \quad 16 \quad 00$
Azimuth of R. P.	<u>$= 70 \quad 38 \quad 48$</u>

STREETS AND TRAFFIC

Norman D. Wilson, O.L.S.

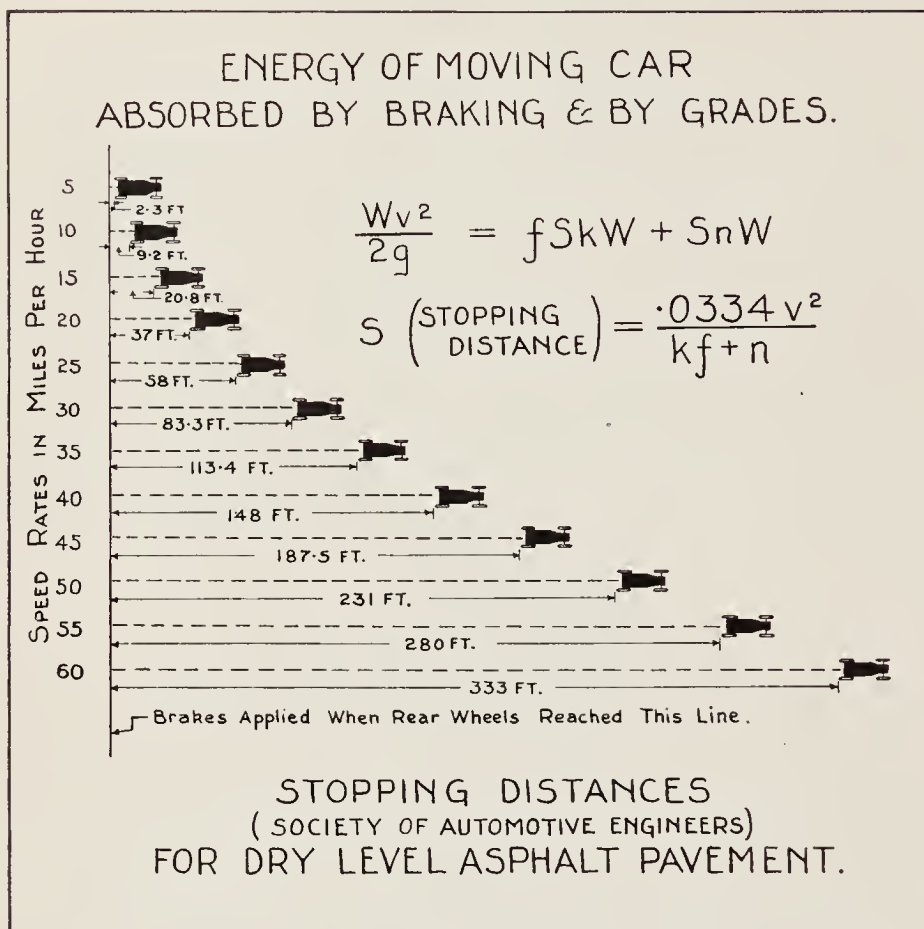
Cities arise and continue to grow until the urge compelling growth is cut off, or until, from the force of unforeseen and indeterminate, yet effective economic principles, they commence to decentralize. While from every viewpoint of monetary and amenitary economics zoning is desirable, yet each succeeding generation retains the right to adjust the boundaries of any zone as conditions warrant. But while zones have altered in the past and will continue to alter, the street system that our fathers laid out is very largely what we have to-day, and the street system we leave our descendants will be basically what they will have as theirs. It follows that we should provide a system adequate in capacity for our own needs, and for those of the years immediately ahead, and at the same time provide as generous a factor of flexibility as we can afford for the unknown future.

Street Capacities

While authorities differ radically that cities will grow according to any fixed law, it is without question true, that cities of comparable geographical location, industrial development, and social tendencies and having similar conditions of opportunity, approximate the same curve of growth. From statistics of such senior cities it is possible to prophesy with reasonable certainty for any growing city, the population, the proportion of it variously employed and its distribution of residence and employment for perhaps twenty-five years ahead. With such determined and with the sit for public buildings, park lands and so on settled, it is possible by empiric rules, based on counts of street capacities, of the number of workers employed and of the amount of inbound and outbound freight of trucking per acre of residential or commercial area, to obtain a figure for the number and width of the major streets required to serve each district. Such a figure is useful, but cannot be considered conclusive.

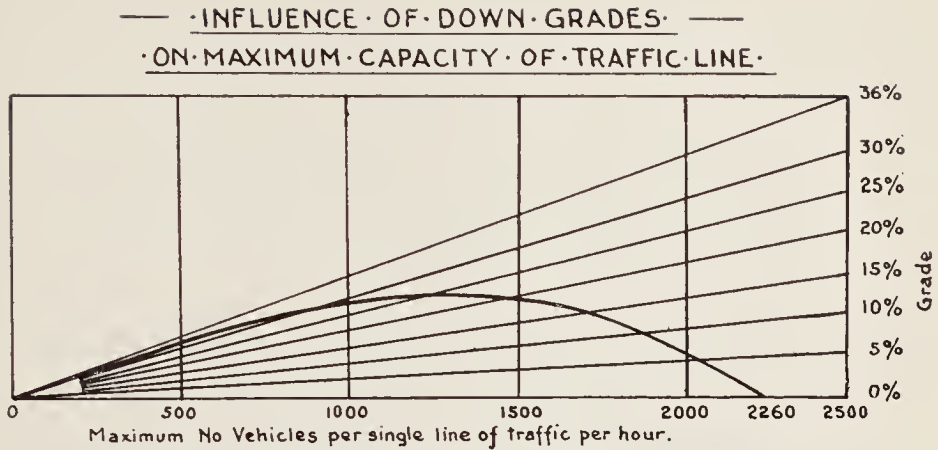
Consideration of theoretical conditions are extremely valuable a premise to the forming of engineering judgments. Figure 1 is a diagram of stopping distances adopted as standard by the Society of Automotive Engineers. A factor of friction of about 0.6 and 60 per cent. of the weight of the car

on the rear or braking wheels, is assumed, giving an effective stopping factor for two-wheeled brakes of 0.36.



From these braking distances a curve (Figure 2) showing traffic line capacity at various speeds is developed; cars being spaced head to tail at their safe braking distances. It may be noted that the maximum capacity of single line traffic occurs when the vehicles move at about 12 miles per hour. Greater or less speed diminishes the capacity of the traffic line.

The maximum number of automobiles which can be passed in a single line on a dry, level, asphalt surface, as may be seen from the lower right hand diagram, is 2,280 per hour. If this stream of traffic be intersected by a similar one the actual maximum would be only half this amount, each being held up one half of the time. Due to cars turning at intersections and



working into and out of parking spaces, possibly one-third of the above maximum, or say 800 vehicles per hour, is the practical maximum capacity of a single traffic line.

Mr. Harland Bartholomew (St. Louis) is authority for the statement that a 36-foot pavement used as a two-way street, with parking permitted and no car tracks, reached its apparent maximum capacity when it carried 2,000 vehicles per hour.

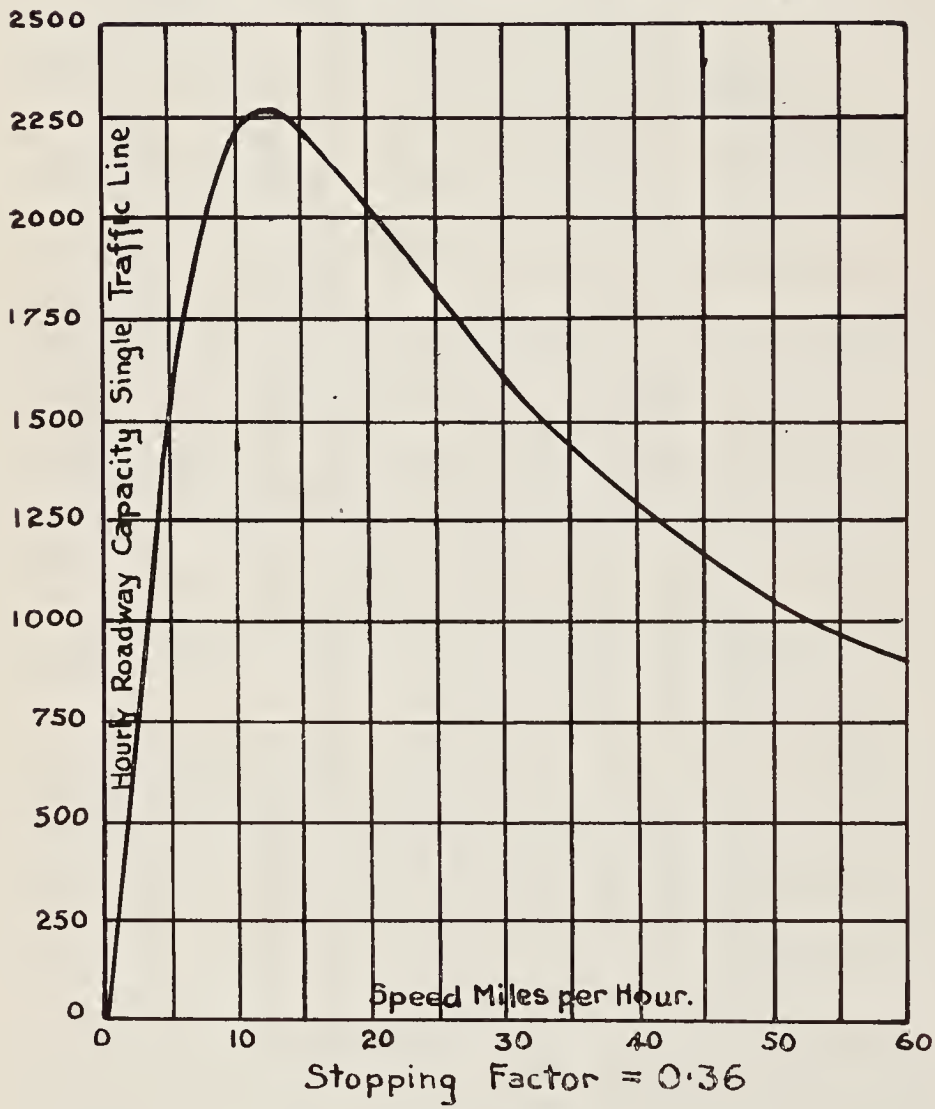
Mr. E. P. Goodrich, in an address before the 14th National Conference on City Planning gave, as the result of his investigations of street capacities, a basic working capacity of 600 vehicles per line of traffic per maximum hour under usual conditions with side parking permitted.

Figure 3 illustrates the influence of down grades in reducing the capacity of the road, this by increasing the stopping distance. The maximum capacity of a single line of traffic is given on the horizontal scale directly below the intersection of a particular grade line with the curve. When the gradient becomes of the same magnitude as the stopping factor, in this case 36 per cent., the capacity becomes zero, for the braking distance is infinite.

The McLennan Avenue Hill in Toronto represents an exceptionally bad condition, with a plank pavement liable to be covered with oozy clay, laid on a $14\frac{1}{2}$ per cent. grade with a double track railway crossing at the bottom. Under what appeared to be saturated traffic, and not very cautious driving (May 29th, 1922) 375 vehicles passed down the hill in one

hour, there being 106 in the peak 15 minutes. This very fairly bears out the estimate that maximum capacity is about one-third the theoretical.

·TRAFFIC · LINE · CAPACITY · AT ·
·DIFFERENT · SPEEDS · ON · LEVEL ·



Traffic Counts

In Toronto and the Metropolitan District east of the Don River is a population, entirely urban in character, of about 142,000. Except for a very limited area paralleling the Canadian National Railways, the district comprising some 2,000 acres of built up and as much again partially built up area is almost entirely residential, though it contains several first-class local shopping and theatre centres.

All through traffic from the east and northeast is routed across five bridges. There are, however, no cities or towns of any size within convenient business motoring distance, with the exception of Oshawa, a manufacturing city of 18,000 population, distant about 35 miles. The through motor traffic at the time the count was taken, April, 1923, may be considered a negligible quantity. The same also may be said of purely pleasure riding.

From this it was found that the one way radial vehicular movement, per head of population, other than street cars, for such ordinary urban district, is 0.9 per day, 10 per cent. of this being in the maximum hour.

North Rosedale is a small area of residential Toronto, entirely cut off from the rest of the city by ravines on three sides and the steep escarpment on the fourth. Access is from the south by the Glen Road Bridge, and from the north the 14 per cent. grade on McLennan Avenue, while Roxboro Road and Summerhill Avenue wind down and across the ravine, traffic by the latter is nil, and by the former a very occasional vehicle, possibly 100 movements per day in best weather.

The total movement counted over Glen Road Bridge in a 17-hour normal day of March 2, 1923, was 2,010 vehicles bound north and 1,946 bound south. The same day at McLennan Avenue hill were counted 340 vehicles bound north and 379 bound south. It would be fair to assume a local business of 1,750 vehicles each way in the district with 10 per cent. of this during a maximum hour. The district comprises 250 acres, of which 60 acres are park and ravine lands. This area has a population, according to assessment figures, of 2,650, and contains 678 houses, 390 private garages, a college for boys, a primary school for girls, Government House, and one industry in the form of a stone yard. The houses are very largely of the better class, though there is a considerable area developed with houses of moderate type, and a number (20) of two-family

houses exist. All in all, the area can be classed as typical for traffic purposes, except as to population per acre.

This count gives a local vehicle movement of $2/3$ per head each way during an entire day. The number during maximum hour is 10 per cent. of the above. That is, it would appear a saturated single line of traffic each way moving at maximum capacity speed will care for the needs of a district with a population of 15,000 people, not making allowance whatever for through or extraordinary traffic. This, however, represents an intolerable condition, where traffic would be reduced to a speed of 12 to 13 miles an hour immediately on reaching an arterial street, or in fact everywhere except on minor residential streets. To relieve this condition and to provide some capacity for a limited amount of through traffic, such outlet must be duplicated, and as a measure of insurance against the blocking of traffic by fire or accident, or the partial closing of either artery for repairs, a third outlet should be added. Since the direction of traffic changes at different periods of the day, week and year, and may entirely reverse itself in years to come, such number of arteries should be available in each of the four main directions to care for the traffic of such district.

Twelve clear radial traffic lines outbound and the same inbound would appear desirable to serve a population of 15,000. Assuming a population of 25 persons per acre, as such lesser density will represent in general the least diversity of traffic direction, an area of 600 acres should be served by twelve streets, or not more than 50 acres should be dependent on one arterial road.

If we consider a square block of city area 400 acres in extent and its traffic as concentrated at its centre, eight streets radiating from there at 45 degrees would be required for the flexible movement of such traffic. If a series of such blocks be fitted together, the resulting arterial street system would be a "Diagonal Grid" with arterial streets about 3,000 feet apart in one direction and at right angles thereto, and others at 45 degrees about 4,240 feet apart. See Figure 4.

This "Diagonal Grid" system is one of extreme flexibility. Traffic may be routed direct to any point of the compass and for any general direction of travel three routes are alternative. As not more than 60 per cent. of traffic is routed down town on a business day, the maximum local traffic on the most direct

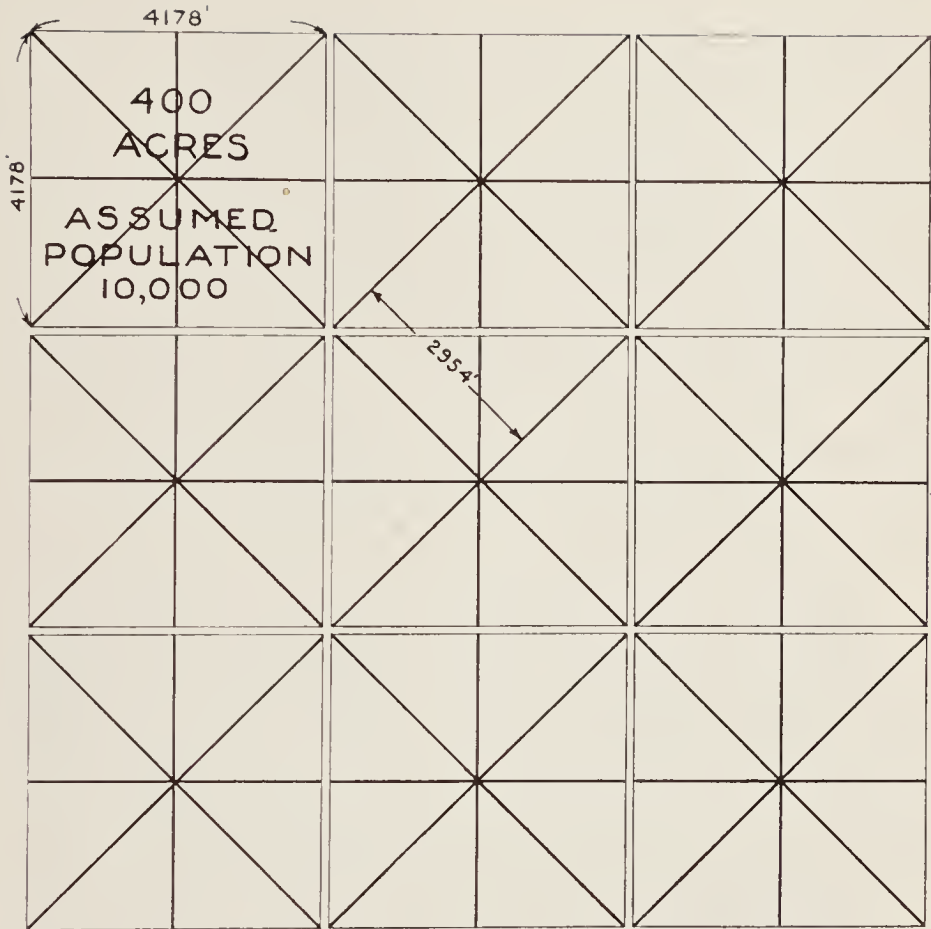


Fig. 4—Development of Diagonal Arterial Grid System.

street will hardly exceed 400 cars per hour each way at maximum travel. At least a thirty-six and preferably a forty foot pavement should be provided on each of these eight streets if parking is to be permitted on both sides.

The traffic from and into a commercial or industrial area is to a very great degree dependent upon the prevailing type of industry, and the presence or absence of private railroad sidings. Authorities estimate all the way from 60 to 150 vehicles per day, or say 10 to 25 per maximum hour for each acre of area. As the ultimate capacity of a traffic line is about 800 vehicles per hour, a clear traffic line must be provided for each 32 to 80 acres of industrial or manufacturing area. That is, the system of arterial diagonals determined above, for resi-

dential areas seems adequate, but barely so for industrial areas, so that in areas logically industrial, the spacing between arterial streets should be somewhat decreased.

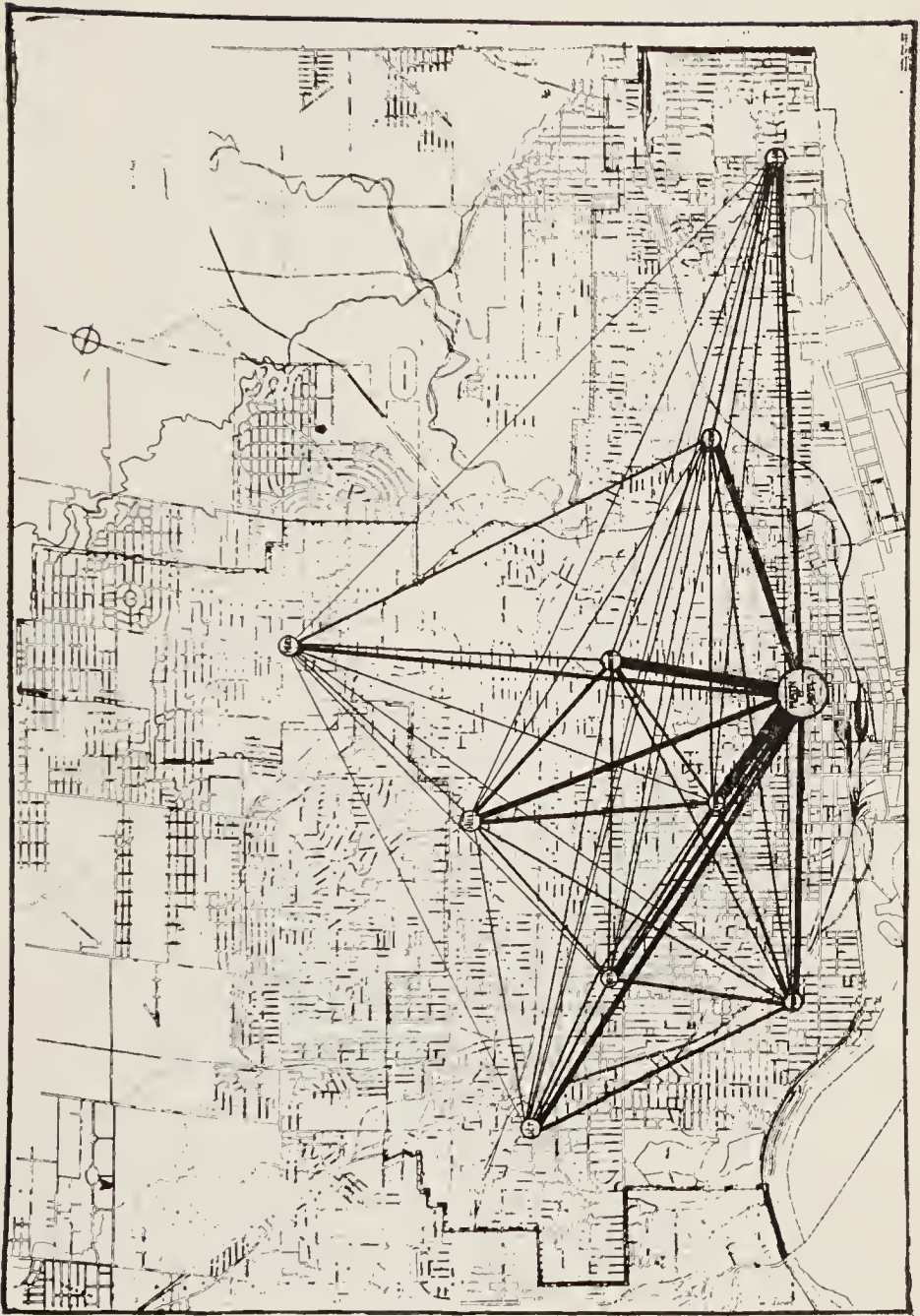
A count was made of the traffic engendered by the group of manufacturing and warehousing plants in the four blocks bounded by John, Adelaide, Simcoe and King Street, Toronto. As these blocks are not served with railway facilities, all outbound and inbound freight must be trucked. Pearl and Duncan Streets, which intersect these blocks, are virtually service lanes, and are so situated that traffic through the area is virtually nil. A total of 725 vehicles were noted inbound and 725 outbound in one day (6.30 a.m. to 6.30 p.m.). The area, exclusive of streets, is 7.6 acres, with about 30 per cent. unbuilt upon, while the total floor space in the block is 20 acres. The vehicle movement obtained was 36 vehicles per day, each way, per acre of floor space, 15 per cent. being in the maximum hour.

Arterial Highway Structure

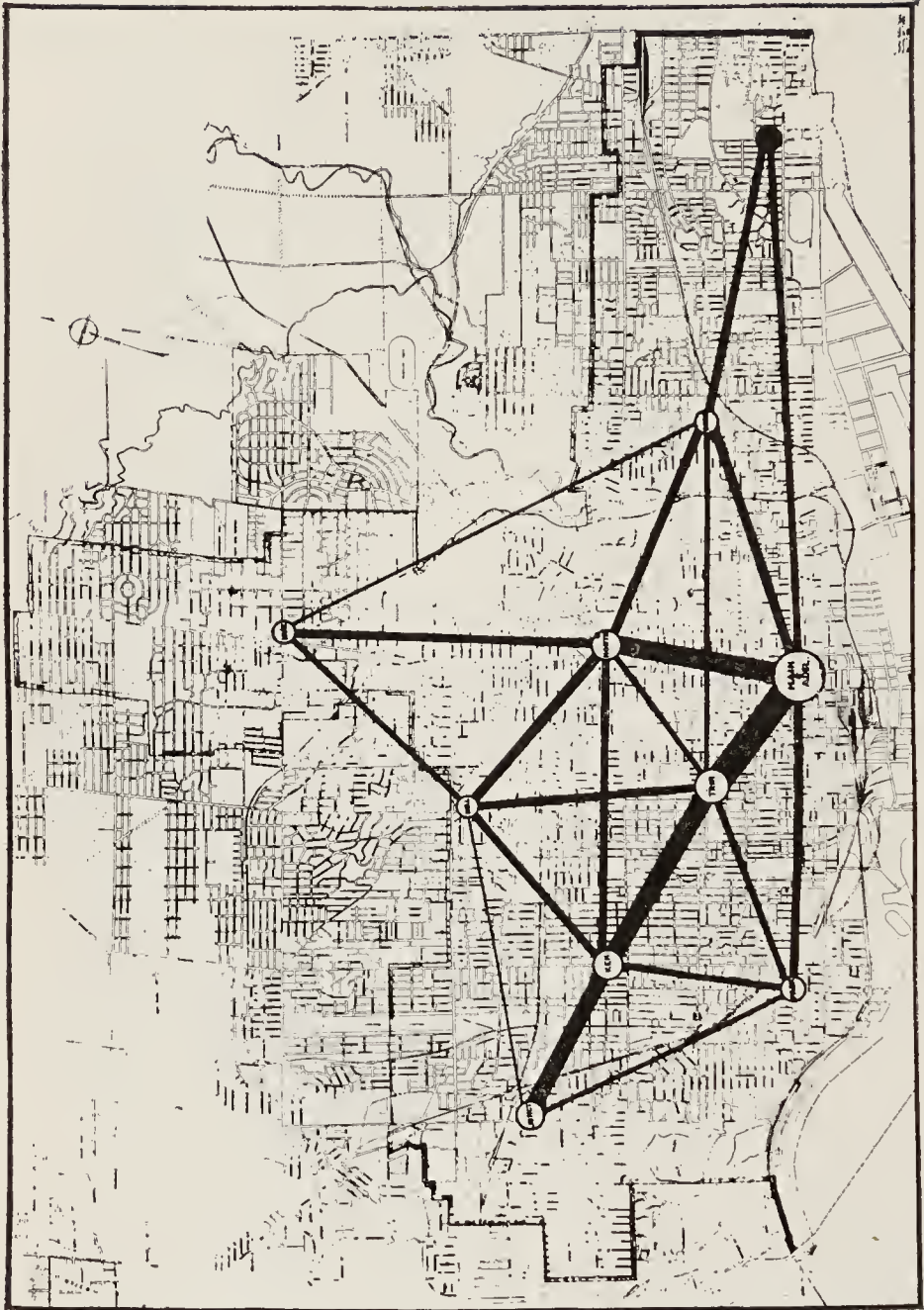
Depending upon the size of the city, very considerable centres grow up here and there throughout its extent, upon which the district adjacent to each turns for its day to day shopping, amusement or community life. Within the limits of each such sphere of influence a very considerable local traffic may develop. In addition there is a preponderately large amount directed to and from the main centre as well as minor amounts direct to and from other local centres or foci.

A very interesting and parallel case is a telephone exchange system, with local exchanges handling neighborhood calls, and trunking through to the several other local exchanges, calls to their respective sections of the city. Figure 5 shows graphically the number and distribution of all interchange calls on the Bell Telephone System in Toronto for a typical day. The great bulk of calls are to and from the centre of the city, yet the extent of cross city traffic is pronounced.

On the principle that where the voice travels the feet may follow, or supposing a messenger utilized instead of the telephone for each call, this diagram shows most emphatically the necessity for diagonal highways connecting the traffic focal points in a city the size of Toronto, and also the possibility and the necessity to route traffic not destined to the centre of the city around it instead of through it. Figure 6 shows the same "telephone messenger" traffic grouped into a minimum number



Direction and Amount of Inter-Exchange Telephone Traffic.



Direction and Amount of Inter-Exchange Telephone Traffic.
Relative Capacities of Arterial Streets Required for
Equivalent Messenger Service.

of direct highways. The deviation from the direct line is nowhere as great as thirty degrees. It is interesting to note that the form these arteries take is that of the "Diagonal Arterial Grid System." As the city grows another ring of telephone exchanges will be built—one is now building in the northeast, and the system of messenger arteries will take more completely the form of the double diagonal.

The diagonal grid system provides a very inviting opportunity for through traffic to detour, as it is necessary to deviate only 45 degrees from the direction of travel. Assuming the business area circular it provides the minimum detour to avoid the congested area.

Assuming a base rectangular system of arterial streets 3,000 feet apart in each direction, and a diagonal system of streets 4,242 feet apart, a central business zone 1 mile in diameter, within which the average speed of traffic is 9 miles per hour, while outside that zone 15 miles per hour average may be maintained, the extra distance travelled in a diversion of traffic around the business zone is 0.94 miles, requiring an extra 3.76 minutes, while without diverting the additional time required travelling through the centre of the business area at 9 miles per hour instead of 15 miles per hour is 5.35 minutes. It is speedier to detour.

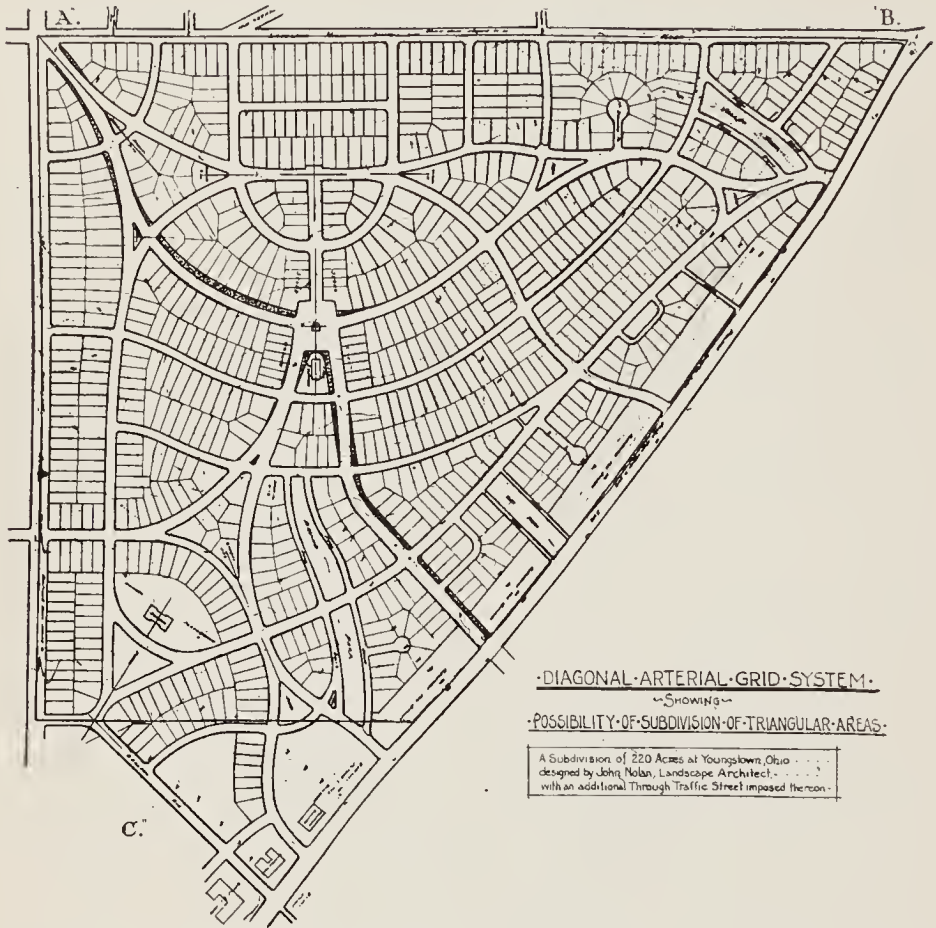
Practicability of Diagonal Arterial Grid System

It is admitted that there are certain points in favor of square intersection which is well expressed in the words of the designers of the New York street plan that "a city must be composed principally of the habitations of men, and that straight-sided and right-angled houses are the most cheap to build and the most convenient to live in."

The Diagonal Arterial Grid System imposes a problem in the subdivision of the major triangles into building lots of satisfactory shape. To show that this can be satisfactorily accomplished Figure 7 is inserted. This is the very happy subdivision of a triangular parcel of 220 acres at Youngstown, Ohio, by Mr. John Nolan of Cambridge, Mass., with one alteration, namely, the development by the widening and deflecting very slightly of several streets of an additional traffic artery through the plan. There is of course no necessity for the two series of diagonals to have a common intersection.

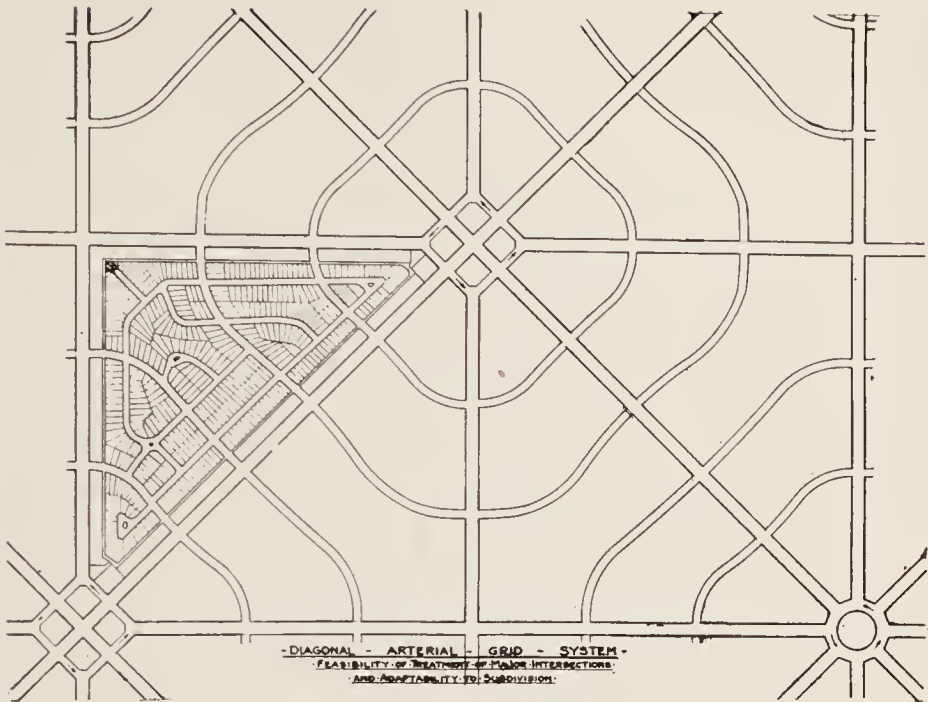
Figure 8 depicts the theoretical subdivision of a section of the Diagonal Arterial Grid System. In this diagram the

major arterial streets are shown in their exact geometrical locations, a condition which will, due to topographical and other reasons, hardly ever be attained.



It will be noted that almost naturally, the major intersections become the hubs of district cobweb street systems, upon which in turn the local subdivisions are based. The streets of such a cobweb system should, as depicted, intersect the arterial roads at right angles. In order to facilitate continuous flow of traffic of all kinds along the major arteries, and for economic spacing of street car stops, these cobweb streets should intersect the Diagonal Grid System at intervals of about 800 feet.

For district purposes such a cobweb system has much to commend it, in that through traffic along the local streets is



Diagonal Arterial Grid System.

Feasibility of Treatment of Major Intersections and Adaptability to Subdivision.

discouraged, while direct access is given to the interior area from the arterial thoroughfares.

The use of the one-way street in solving traffic problems at the oblique intersections of the Diagonal Grid System is also illustrated on this plan, and the possibilities of street vista are well brought out.

Economic Loss Through Discontinuity of Streets

Possibly no one thing has imposed so much financial burden on the people of Ontario and elsewhere than has the laying out of road allowances in the original Township subdivision on the gridiron plan without regard to topography.

The gridiron township subdivision has naturally led into the gridiron city subdivision, and the methods of survey adopted for convenience of compass work in the township subdivision have reacted in the discontinuity of the great majority of the city streets where they cross the original concession or side lines.

The street system is so planned that the main artery, on which is a rapid transit line, is intersected by so few cross or local streets that only 3 stops per mile on the rapid transit line are required.

Snow Removal

The question of winter operation of automobiles and the effect of snow upon the capacity of roadways, is one which has received insufficient attention in the past.

With any extent of snowfall, particularly with sidewalks laid against the curb, and the snow shovelled from them into the roadway, a two and even a three traffic waystreet becomes reduced to a single trail. As the snow becomes packed and the season advances, the streets become a series of icy ruts impossible to leave, and if a car once gets out of its proper rut, other cars cannot pass, and a wide street becomes temporarily, a one traffic line street.

To bring conditions to anything like normal, both from the standpoints of safety and of capacity, the pavements must be entirely freed from snow. Up to the present snow removal has been largely considered a question of unemployment relief.

An investigation into the cost of snow removal by men and trucks in Toronto during January and February, 1923, when 39 inches of snow fell in some twelve snowstorms of account, developed a cost of .025 cents to .040 cents per square foot of pavement per inch of snow, depending on the extent to which the street was cleaned, which in no case was to such a degree as to permit motor cars to continually travel along the roadway without encroaching on the car tracks.

There are 406 miles of paved streets in Toronto, of an average width of 28 feet. To remove the snow from the pavements by shovelling into wagons and carts, to the extent of half that which fell, the cost would be \$1,188,456 (at .03c. per inch of total snow fall), equivalent to an assessment of 1½ mills on the dollar.

In Engineering News Record of Feb. 8th, 1923, is given an account of the removal of piles of packed snow and ice from the side of the street by steam shovel and motor truck after a very heavy fall of snow in Hartford, Connecticut. From the figures given, the removal of the snow was accomplished at the cost of 14c. per cu. yd. by steam shovel and motor truck against 30c. per cu. yd. by the use of men and teams, repre-

senting, respectively, .0432 cents and 0.0926c. per inch of fall per square foot of pavement.

The cost in keeping the streets traversed by the bus routes in Toronto entirely clear of snow, by plowing it back to the curb or up on the grass strip where the same is adjacent to the curb, for the months of November, December, 1922, and January, 1923, with a total snowfall of 45.8 inches, was, with allowance for equipment and overhead charges, very closely .0045 cents per square foot of pavement per inch of snow.

It follows that if a street were sufficiently wide to permit a ten or even a six foot grass plot between the sidewalk and the curb, snow from the pavement could be readily plowed on to this boulevard at one-tenth the cost of cleaning the streets to the same degree of thoroughness by removing the snow in wagons to sewer inlets or dumping grounds, as is necessary when the sidewalks are laid next the curb, or where the pavement is not sufficiently wide to accommodate traffic while permitting windrows of snow to be piled along the curb. Assuming that private driveways would have to be shovelled clear every fifty feet, and the snow carted away, cleaning the streets could still be accomplished at one-quarter the cost of teaming away, or for .01 cent per square foot of pavement per inch of snow, the equivalent for a 30 foot pavement of 10c. per foot frontage per season (66 inches snow).

If for the moment it be assumed that snow removal from the pavements be charged as a frontage tax, as is sidewalk cleaning in some localities and instances, and that the saving by piling the snow on the boulevard is only one-third of that indicated above, it would still amount to 10c. per foot frontage per season, and the capitalized value of the boulevard strip to the frontage would be about 1.75 per foot front. As most land in new subdivisions sells for less than \$20.00 per foot for lots 120 feet deep, or 17½ cents per square foot, it would appear profitable to the purchaser to have streets sufficiently wide to permit such ten foot grass plots, even though the cost of reserving them was added to the selling price of the lots.

In the great majority of instances, in fact for all residential streets, no additional width is required above the standard 66 ft. street, provided the sidewalks are laid adjacent to the street line, and not at the curb.

While on arterial streets in the more outlying or residential portions snow could be so piled, it is not likely that such

could be permitted on any business street. The use of an elevator-grading machine to elevate the snow from the windrows thrown up by the snowplow to motor trucks, or dump cars if street car track is adjacent, is possibly one way by which the great cost of snow removal could be lessened.

A pavement wider than the bare necessities of maximum traffic is desirable for winter conditions, while in the rare circumstances of a street being wider than required for the immediate needs of traffic, if the excess cannot be left as a grass strip, it should be thrown into roadway, and not into sidewalk.

Width of Streets

A very great deal of misplaced effort has in the past decade been indulged in in Canada by fairly eminent authorities on Town Planning, decrying the so-called waste of land in making minor streets as wide as 66 ft., the minimum legal standard in most provinces. Their opinion has been based on the tendency of Town Planning in England and the Continent, and the effect of the Canadian winter and the necessities of automobile traffic appear to have escaped their consideration.

While all admit the desirability of building lines being at least this distance (66 ft.) apart, very strong opinion has frequently been expressed that at least 10 feet on each side of this width might well be held in private fee for use as garden. To such I take strenuous exception. When 66 ft. is the width of the dedicated roadway, there is much less desire to encroach and less chance of obtaining permission to encroach upon the dedicated street than upon simply a building line, which a supine municipal authority may feel free to vary. The cost of water, gas, and sewer connection is the same in any case, as these services extend from the main to the building on either side. Trees when planted along the street are on city lands and can be cared for by the civic authority. In only one particular does the wider street entail an obligation on the community at large, and that is the liability of the city for damages in the event of accident occurring on the public highway due to excavations, etc., this liability being slightly increased with a wider street. The statutory width in Ontario has been 66 feet for so long that, in the absence of any real reason to the contrary, this width should remain as minimum for minor streets.

For present conditions of traffic, no roadway should be laid out less than 30 feet in width, as this is the minimum safe width permitting two vehicles to pass opposite a parked vehicle. The eighteen feet on either side of such roadway in the case of a 66 foot street provides 8 feet available for sidewalk and 10 feet in grass plot between the curb and the sidewalk. (Fig. 13).

For a street providing two clear traffic lines at least 40 feet of pavement is desirable, and this can be attained very effectively on an 80 foot street, with grass plots also available for snow piling.

For six lines of traffic, which is the desirable width for street car operation, 60 feet of pavement is required if the tracks be paved. This permits the keeping in motion one line of vehicles opposite the street car stops, the other being held up by passengers loading and unloading. The total width of street allowance in this case would be 100 feet.

One hundred feet will also permit the use of open track construction on a private right-of-way in the middle of the street, but not without a crowded appearance. For this cross section a width of 120 feet is desirable, which again gives room for the useful grass plot. For absolute traffic saturation, the street 120 feet wide can be constructed with an 80 foot pavement, carrying eight lines of traffic, or approximately 5,000 vehicles per hour, 2,500 in one direction per hour, or 35,000 per day, being the traffic generated by a population of 350,000 for whom the street in question provides best outlet.

For the diagonal arterial grid system, streets forming the larger grid should be at least 120 feet in width, and those of the smaller grid diagonal thereto, at least 100 feet wide, while all secondary streets, unless in exceptional circumstances, should be 66 feet wide.

It seems absurd that it is necessary to point out that the pavement width bears no essential relation to the street width. The pavement is a present consideration, paid for in ten years, the street width is for to-day and likely a long to-morrow. If a narrow pavement on a 120 or a 100 foot street is all that is immediately warranted, the balance of the street width is available as a park.

PROPOSED AMENDMENTS TO TOWN PLANNING LEGISLATION

J. J. Mackay, O.L.S.

Mr. McKay—Mr. Chairman and Gentlemen: Mr. Seymour has pitchforked me into this position today. All I have to say is may the Lord protect you from your friends. It reminds me of a story I heard the other day, about the minister whose wife had presented him with a fine boy, and the congregation thought it would be a good thing to make him a presentation, and they presented him with \$50.00, and two friends went to him and asked him as to which he would give thanks for, whether for the boy or the \$50.00, and when it came time the way he put it was something like this: "Oh, Lord, we thank Thee for this timely succor (sucker)." I rather think what Mr. Seymour had in mind when he had my name printed on the program was more the idea of creating a discussion on the question of Town Planning.

This is a subject that has to be kept alive, and it is for you surveyors to look after that part more or less. Mr. Thomas Adams conceived this idea in the first place, and some years ago there was quite an activity in Town Planning. The Planning and Development Act as passed, gave certain powers to cities, towns and villages in regard to town planning. It was good in itself to a certain extent, but the unfortunate part was that the Act as created gave too much or too large powers to the Town Planning authorities created under the Act, inasmuch as one of the clauses of the Act made it possible for the Municipality to instruct City Engineers. That would probably be telling the City Engineer's Department to do the work in the same way as they would be instructed by the Mayor or Chairman of the Board of Works, and the Council felt that was too much power in the hands of an independent party. It also gave power to spend money, and the Council had nothing to say as regards that. They had to pay the bills presented and signed by the Chairman of the Board, and I think it is the result of these clauses in the Act that town planning powers were conferred upon Councils.

In Hamilton, with which I am more familiar than anywhere else, we have a Town Planning Committee, advisory to the Council. It had really no powers any more than in an ad-

visory capacity. It had no funds except a nominal amount of \$250 or \$300, which was simply sufficient to look after stationery and postage, and a small stipend for the Secretary, and it was in the position that if recommendations from the Board were passed on to the Council, the Council could deal with them as they saw fit. They could either put them into discard or embody them in their own recommendation to the Councillors. At the present time our Board down there is constituted of ten or twelve members, several are technical, inasmuch as we have one member appointed by the Hamilton branch of the Engineering Institute; the Ontario Architects have a member, the Surveyors have a member, and the Chamber of Commerce have a member, and the Ladies' Association has a member, and the Trades and Labor Council has a member, and you can see in that way that the personnel in the Board becomes more or less non-technical, and in that way, I think, the functions of the Board are really lost sight of. I think really a Town Planning Board should be a purely technical board, because town planning in itself is more or less a purely technical question, and one of the big difficulties is we have not been able to get legislation. As a great many of you know, there are Town Planning Acts in Alberta, Saskatchewan and Nova Scotia, but unfortunately in the Province of Ontario, where a great many towns, villages and cities are extending and growing, we have no comprehensive Town Planning Act to govern us. Attempts have been made, but it has resulted in failure; as today it resolves itself more or less that if a city or town wishes to proceed with a comprehensive town planning scheme, it involves itself into getting a special Act for that purpose.

I understand Mr. Seymour in his work in Waterloo and Kitchener is attempting to have certain amendments made to the Municipal Act, which will make it possible to proceed. One of the great ideals of town planning schemes is to have them permanent. That is, that a scheme once adopted by a Council must not be thrown into the discard. That applies to Councils of cities, so that incoming Councils of the following year or subsequent years following must not do away with it. In other words, if the general scheme is finally adopted and laid down it should be of a permanent character, so that unless the consent of some board, like the Railway Board, was received, no change could be made in the scheme as adopted. A part of this big question of town planning

is the question of zoning, especially as applied to a growing city like Toronto, Hamilton or Ottawa. At the present time there is really no permanency to the zone. We have had several cases of this at the request of private individuals, in cases where they wanted to construct warehouses, where the Council removed restrictions from a district to permit different buildings going up, to those intended in the first place. That action really nullifies the effect of the zoning scheme—lack of permanency, and that is one of the big features, I think, in town planning, giving the necessary legislation which enable a town planning scheme to be worked out, and that after once being worked out and adopted by the Council that it should be of a permanent character, with the provision that only such alterations should be made as are necessary. And for this purpose it should be under the jurisdiction of some board independent of the city itself.

I think Mr. Reuben has struck a note that applies especially to Ontario Land Surveyors. He said every one of us, I rather fancy, is practicing with our headquarters in a city, town or village. I do think the Ontario Land Surveyors have it within their power to be pioneers in the work of town planning. There is not a village, town or city in Ontario today that does not need more or less town planning, inasmuch as usually a Council is coming in one year and out the next, and they do not look far enough ahead in the development of their city, town or village, and the surveyor being a technical man, should naturally have his home town at heart, and is, I think, the man who should be the logical leader in the work of looking ahead towards the proper development of his municipality, and in that way, I think, he can do a great work.

I do not know, gentlemen, that there is anything more I can speak about. I would like to invite discussion, and have the opinions or wishes of any of the members here, and discuss the matter as fully as it is possible to do, and put forward any suggestions you may be pleased to give.

DISCUSSION

The Chairman—I think the matter is open for discussion. Mr. McKay has brought out a number of very interesting points and I think they should be very thoroughly discussed.

Mr. Seymour—I rather made a promise to Mr. McKay if he would introduce the subject I would add one or two words,

and it was also suggested to me that some indication of our work along practical lines might be of value. I do not want to keep you but a few moments. I would like to indicate three of the practical phases of our work, as illustrated in Kitchener and Waterloo, and I will draw a little diagram on the board, if I may. I would just like to say that this is our practical way of going about the system of town planning and dealing with practical problems that arise. What we know of continental town problems on the continent is very little, but may be of some advantage to us some time. It is not of much use to us here to talk of problems if we cannot spend \$250,000,000, as Paris did, to reconstruct their city. If we had the money and did, we would probably have the same experience. They found they improved to the extent of \$250,000,000 in order to become one of the show cities of Europe, and whatever improvements you make to your city, you may be sure it is going to return to you from the tourist and scenic end.

I want to speak of three practical phases of town planning as we regard it, and show what legislation we have to carry these phases out, and what further legislation is advisable.

I will draw a very rough diagram; let us assume this is a town with a street system. I will leave it that way. We will take this as the urban zone, which is three miles from town and five miles from the city, and in this area a Council can control sub-divisions. That is to say, they can, according to the Act, control the width and location of streets, and also the form and shape of lots, but as a matter of fact that latter part can be overcome if the owner wishes to sell his lots by metes and bounds. You can control the location of lots and width of roads. In general, I think, as Mr. Wilson explained to you this morning, in such a system as this we want radiating roads. I think he told you twelve radiating roads would provide comfortably for a population of 15,000. That is the first consideration in what I will call the development in the urban zone, as to a street system of highways.

You want to get a radiating system of highways towards the centre. The development brings them practically up to the centre of the city, and in many cases it comes to a point which can least receive that congestion. Our next endeavor would be, having established these radiating roads, is to put circular roads at proper intervals, so anyone coming in on a radial road can get around without going through the centre

and increasing the congestion there. This is one phase of the development of the urban zone, and we have other good powers as to the actual laying out. There is not much control on building development unless you can persuade your abutting townships to take advantage of the Municipal Act and zone for residences. In the case of Rockcliffe, adjoining Ottawa, they have taken advantage of Section 296 of the Municipal Act and they are entitled to say how far houses shall be set back and how far apart.

The second matter is that of zoning in the city. Incidentally I should have remarked that that can be done without expense unless you want this development to precede the sub-divisions, and unless you want this lot to be built on before this man sub-divides. If you wait for sub-division, you can get this for nothing, and it is no more expense.

The zoning of the town itself may be carried out under the Municipal Act into various residential, commercial and industrial zones. Under the Act as it stands at present, Section 399A allows you to create private detached residential districts with the approval of the Railway Board. If we do not get that amended, as we are trying to do in Kitchener, so that we can specify these other zones, we have to go through a more complicated procedure and take advantage of other sections of the Municipal Act which do not come under the Railway Board. Section 399A gives permanence, because it has to go before the Railway Board before it can be changed. We can then provide detached residential districts under 399A. We can get private residential districts if the Council will pass it, but the next week after they pass it they might change it. We can have business areas under Section 409 by two-thirds majority of the Council prescribing certain establishments that cannot go in there. We can take advantage of the Public Health Act, which provides penalties if you put in anything without the approval of the Council or the Public Health Board. It becomes expedient to have legislation. For that reason we have asked to have 399A amended.

You can put on a zoning ordinance without any more expense than a building by-law. There was no building by-law some years ago in Ontario, and people could build as they wished, and finally each municipality thought it should have some control of building, so building by-laws were put in.

There is no objection that could be urged against a zoning by-law that could not be urged against a building by-law.

We take no objection to the building by-law. One man may be within the fire limits, and the man who is just opposite can put up a frame building, and then this man might claim I am one hundred feet or so away, and there are certain restrictions on me that are not on the other man. We know that is for the benefit of the community. These are two matters that can be done without cost.

The third matter is reconstruction, and costs money, and would have to be done under the ordinary by-laws. Anything we do in Kitchener will have to come under the ordinary by-laws, and if we cannot get a street through by agreement we will have to expropriate. That is a very brief explanation of the three phases of Town Planning. The surveyor is particularly interested in the first at the present time, and we hope his interest will extend to the other matters.

In addition to this there is the matter of the establishment of parks and school sites, and prescribing these ahead of time, and locating them so they can be bought or obtained by gift, in some instances, and many other matters, which in making a plan you can control.

Generally, in speaking of legislation, there has been an endeavor to have an amending Act to the Planning and Development Act in which a number of us have been interested, and we have been told the present Government will not consider anything of that nature. All we can expect is certain small amendments such to the Act as it stands. Three or four things have been mentioned as being possible. That one of zoning, another restricting the sale by metes and bounds, and third that of requiring some local improvements before the registration of a sub-division. In the proposed zoning by-law we impose certain restrictions on buildings on streets on which pavement has not been laid or on which sewer and water are not in, which will have the tendency to keep development where sewer and water now is. Under the zoning by-laws we prescribe how far houses have to be apart, and how far back from the line. That has the result of keeping the sales by metes and bounds within limits, because if a house has to be built eight feet from each side line in such an area a man would not buy a lot 25 feet wide. Indirectly we control the sale by metes and bounds once we get a zoning by-law. We can also get two or three other matters indirectly, but I think I have probably taken enough time excepting to say one thing, that there are many matters that

are town planning in their nature. For instance, Mr. Neelands was telling me he was able to persuade them to have the telephone poles placed in the lanes in Cochrane. We like to have poles and other devices in lanes.

The Secretary—I do not think I can add very much to what Mr. Seymour and Mr. McKay have told you. This town planning question has hitherto always been more or less nebulous, and it is only recently people have got definite ideas as to what it means. As it develops town planning embraces the whole scope of municipal endeavor.

I would like to call your attention to one or two of the very urgent needs in the matter of town planning legislation. As Mr. Seymour pointed out, it is quite an important point that this legislation or any other legislation you undertake to put before the House, must deal with one phase only of town planning. The reason urged is that if you bring in a bill that provides, as the proposed bill provided, fifty-two clauses, it only takes one man in committee to say I object to clause 43, and the whole bill is thrown out. The suggestion we have had from certain officials is, if you want anything have it made as short and as concise as possible, and preferably have it in a private bill to be introduced by a private member. I understand sympathy is shown by certain members of the Government towards legislation controlling the sales of land by metes and bounds. There are one or two other matters which probably might be mentioned.

The question of local improvements is a big one, and is very closely associated with town planning as permitted by the Planning and Development Act, consisting solely of the location and designing of streets. It becomes more and more apparent that local improvements are needed before registration. This system has been adopted in many cities in the United States, where it is a necessity that local improvements shall be put in before a plan is registered. Real Estate Boards generally express themselves that local improvements should be obligatory in all cities.

This question was mentioned at the convention of real estate men in Cleveland last year, and it was the unanimous opinion that it was better for their business, as they could sell a completed lot, and they found no difficulty in selling such lots, since purchasers generally were able to move in without waiting for sewers, etc. The development surrounding a city

like Toronto, where unrestricted sub-division is permitted, may be shown by these figures. Since 1912 the city of Toronto has approved plans and sub-divisions aggregating 20,549 acres, that is, land equivalent to the present land area of the city of Toronto. The greater part of the land is unimproved. Restrictions which would have made it imperative that all local improvements be placed upon land before registration was permitted would have had this effect: It would have curbed development for speculative purposes and would have permitted development for residential purposes. I would like to call your attention to the development of North Yonge Street. The whole country has been subdivided one mile and a quarter east and west of Yonge Street; it has been sold in many cases to the speculator and in some to the home builder. The home builder has constructed a shack or house. The land in the whole of the district covers something like ten or twelve square miles, and is sparsely dotted with small dwellings, and that means the supplying of these people with public conveniences of any kind is impossible. If, on the other hand, registration of land without improvements had been prohibited, the whole of the development could have taken place on a strip of land five hundred feet on either side of Yonge Street. These people could have had all the land necessary for their building operations and the balance would be preserved for agriculture, instead of producing nothing, as it is at present.

The question of local improvements is one which is bound to come, and it will come only by the education of these people who deal largely in real estate. We have one man in particular I know who has something like \$5,000,000 worth of vacant land, none of which is improved. Who will bear the expense of local improvements is a little hard to determine. Yet the price of land in Canada is too high, and when this thing is sorted out and settled down to a proper basis, it may be found that the original owner or the farmer will find he has to take less for his land or he will have to put in the local improvements himself.

There is one other point I would like to speak on. Mr. Seymour, in outlining the operations which had to be undertaken in preparing plans, spoke first of arterial roads and main roads leading from the city and to the city. The powers given now under the present Planning Act are limited to suggestions by municipalities or Town Planning Commis-

sions, who may prepare and submit plans showing where these roads should go. We are designing thoroughfares which we feel will serve transportation in the future, and the suggestion I have to make is that power should be secure to condemn the lands required for these main roads for highway purposes, subject to compensation on the basis of agricultural values if the municipality assumes the road before the owner wishes to subdivide. I believe this could be done without injustice to the owner, as the owner is only holding land for agricultural purposes until such time as he is going to turn them over to the public as highways. In conclusion let each one of us feel it a duty to conduct a campaign in his own municipality in connection with this matter, for the education of the public and the advancement of town planning.

Mr. McRostie—Mr. Chairman, I can say to Mr. leMay that he has just said what was on my mind. I think the question is a very important one, as all speakers have said, and it is a matter of legislation. We should go ahead and try and get something done. I agree with Mr. leMay that the important thing would be to stress the principle of the thing and leave out the details. We should avoid dealing with Councils as much as possible. It is said the ideal may be very far ahead and public opinion is not, at the present time, ready for it. The matter of practical application cannot be far ahead of public opinion. We have to educate the people, and we have to educate them along the lines of helping us in the working out of this scheme.

I would like to say a few words about zoning. I believe the people of the larger cities and possibly some of the smaller, are coming to see that the matter of zoning is a question for them, and it is going to put dollars in their pockets, and they are commencing to see, the individual, that the scheme is good. If the individual finds as a result he is going to be dollars in pocket, he is going to be prepared to adopt it.

There are certain cases we have in the city of Ottawa where we felt restrictions put on property were too much, and they have been that way for a period of ten or fifteen years. Some apartments went up or some man built out to the street line where he was supposed to keep off, and there was quite a complaint from the people in the locality. Next year it may be some other part of the city is going to be in that position. The result has been certain sections have got

resolutions passed by Council placing restrictions prohibiting certain classes of buildings going up, and while these are only piecemeal, still it indicates the need of having a definite and comprehensive zoning by-law, and that is what we are attempting to work out at the present time—to get the people educated up to the point where they will see that is necessary, and get a comprehensive zoning by-law passed which after all is very closely allied to the building by-law. I think that public opinion is working, and working very fast, towards the point where they will adopt this principle.

I would like to say as a word of encouragement that you can keep fighting away on these things for a long time and not get any results, and all of a sudden you will find support and favor in sections where you never had it before.

Mr. Reuben—I might ask your permission to use the board, being as we are all drawing plans. A few years ago a road came around like that; they are building a new bridge and building a new highway across there and it cost them \$44,000 a mile for the road, and they are spending \$450,000 on the highway. At the present time there is a complete road right through and just at the corner they have recently erected a college. The whole of the highway was built at an excessive cost, but I do not believe you can build it for anything less at the present time. It is unprotected, and is of practically no use as far as traffic is concerned, but only for its looks. There is nothing on the highway and it would be a good chance to have got the Council to adopt some scheme that would compel some people to live up to these views that have been expressed.

The Secretary—Mr. Reuben has referred to Bloor Street West, which is a Provincial Highway, and is not sixty-six feet. It was made 86 feet the whole right of way, and that provides for the keeping of buildings back from the street line. The college, as Mr. Reuben mentioned as being at one of the corners, was set quite a distance back from the street line. If you will notice, the front of the building is 25 feet north of the 86-foot limit, and all of the college surroundings are taken care of entirely off the limit. As far as any other restrictions go it will serve to prevent future buildings, banks, and so forth, from getting any further towards the street line. It will not be possible to construct gasoline tanks or anything like that in front of the 86-foot limit; they must be 86 feet back.

Mr. Reuben—Most of the land has been cut right through; it is not a very good section; it runs a mile and three-quarters or two miles. I believe in that section the price of land is \$65.00 or \$70.00 a foot. There is no law in force that is going to protect that highway from anything. If anyone wanted to put up a Chinese laundry, and so on, there are no restrictions which would force them to spend hundreds of thousands of dollars. There should be some law designing some class of buildings that should be put up there.

Mr. Ransom—I am certainly in sympathy with town planning, and certainly appreciate these papers that have been given this afternoon. There has not been much said about the rights of owners as regards town planning development, the side taken is that it is for the benefit of the public. At the same time, being on a Provincial Highway, the very fact, as Mr. Reuben says, the land being sold at \$65.00 a foot insures they are not going to build shacks on it. These things have a great tendency to right themselves and the least legislation we have along lines like that is very often the best.

I have been a student of legislation, not only municipal and provincial, but national and international, the last few years, and it seems the tendency is to pass laws, and I think there is going to be a big reaction set in in the not very great distant future against this.

The Chairman—You mean it is good work?

Mr. Ransom—There are a couple of little things do not appeal to me from the standpoint of a citizen, but not so much from the surveyor's point of view, and it is, for instance, restricting what a man can do if he buys a piece of land on a highway. Secondly, the view that Mr. leMay mentioned about local improvements being required before a subdivision plan is put on. I happened to be personally interested in a piece of property in the United States that was subdivided previous to the war. As soon as the plan was filed the city brought in local improvements on the streets without consulting us at all, and sent us a bill saying they were charging for connecting up cross streets. This went on for some years. As soon as the property was sub-divided the city put in these improvements. Outside of a few lots, that property has run for about 14 years, and all local improvement had to be paid for in cash. The manholes of the sewers were, in some cases, three or four feet above the ground

line. These had caved in twice in four years, and have been knocked off and taken away, and it has cost considerable money to keep them up; as a matter of fact, one of the sewers got blocked up. Just after the property was opened up and war came on and the property would not sell. The property is selling now, but it is costing money and it is very difficult to get what it has cost in capital and interest charges.

Take today, the ordinary working man has the option to go a little north of St. Clair Avenue in Toronto, in the county outside the city limits, and buy a lot at a reasonable price, and get sewer and electric light and all these conveniences, but what does he do, just goes up Yonge Street and back a mile and a quarter and buys a five-acre parcel or an acre parcel. He will dig his own well and is quite satisfied with all the improvements he has there, and perhaps start a chicken farm or market gardening, and as a matter of fact that is intensive farming, and he will operate that five acres and get more out of it than it has ever produced before. If we restrict the putting on of sub-divisions, especially these acreage parcels, down to where they could not be put on without locals, it is going to keep down the working man who is looking for cheap land and wants to have a garden.

Mr. Gibson—Just a word along the line of putting improvements in sub-divisions. I might mention the fact that we have around Toronto and suburbs places that bring a lot of surveyors here. We have North Toronto, Weston and different places, and they are all expanding, and we have to suffer for that. It is very expensive to have surveyors to survey land and sub-divide land and re-survey it. It requires a lot of work. Let us sub-divide land and put in sewers and water and we will have a happy time. All we have to do is sub-divide a little bit and make location surveys of the lot and house and stick to that, and get the improvements as we go along. It may be a big advantage to keep out big surveyors' bills.

Mr. Reuben—Mr. leMay mentioned a point regarding a meeting in Cleveland. This convention was there last year and the reports were to the effect that all over the United States they are putting in improvements in one hundred acre farms, roadways, gas, water and sewer; in any place where there was no gas works they built their own gas works and sold land at \$25.00 a foot, all improved and everything. As soon as you paid \$25.00 a foot you paid all that.

Mr. Ransom—It was pointed out here in Toronto not long ago that there was only forty per cent. of the population owned their homes—I am speaking of the conference held in the United States, where the paper was read in regard to Cleveland. In Toronto there is something like sixty per cent., and in some districts as high as eighty per cent. That is a condition of affairs that you may say appears all through the United States. Take in the city of Buffalo, you cannot sell vacant land even though it is improved. The only thing you can sell is improved property, and it has to be apartment houses and duplexes. People there do not buy their own homes; they rent places, that is the condition you get when you get the highly improved property and not let people scatter about into the country.

Mr. Seymour—I have been pleased to hear the discussion and the papers. I do not want to keep on talking, but I would like to say something in regard to the discussion that has arisen, especially as regards what Mr. Ransom said in regard to the individual. I am an individualist, and I am anxious to preserve the rights of the individual, and I believe town planning would do that. I do not approach it from the socialistic standpoint; I approach it from the standpoint that I am going to protect Mr. A. and Mr. B., but I am going to protect the individual, as Mr. Ransom has said that the owner of land has certain rights. As to the location of improvements, there are various things to be said as to whether improvements should be put in before or after. In engineering what we try to do is take the average viewpoint, the features existing as to whether they are suitable, and so on. A man cannot get improvements for a parcel, say of two acres, unless he has made provision for such. We are not providing for five acre farms or one acre farms. Take the case of a street on which lots have been previously sold, and where one owner comes to a municipality and says I want to build, will you put in the sewer? But unless these improvements have been established in this particular neighborhood the municipality is not going to the expense of putting any sewer there. If you can get a petition, all right, but remember, it will not be a reasonable solution of the difficulty.

DRAINAGE

By J. R. Scott.

Comments on the Municipal Drainage Act.

Improvement at a minimum of expense to the taxpayer is the intention of the Municipal Drainage Act. With this evidently in view in designing this Act, its administration is left largely in the hands of the municipal clerks and engineers, and since any minor irregularities in the proceedings taken do not invalidate debentures issued (Sec. 58), there is eliminated the legal scrutiny to which proceedings under the Local Improvement Act are subjected. While, however, effort has been made to minimize the number of legal actions by giving the engineer great latitude, we find that especially where more than one municipality is interested in a drainage by-law, suspicion or misconception has resulted in many legal actions, from which we are enabled to glean a few enlightening remarks on the interpretation of different sections of the Act.

Engineer's Opinion Valued

I would like to note the remarks made by Mr. Henderson at different times, in the course of which he expresses the confidence placed by him in the evidence of a municipality's engineer acting under the provisions of this Act. The engineer is always assumed by the referee to have based his report on thorough and conscientious examination and consideration, and this is an opinion to be highly valued. There is the possibility in isolated cases that in a desire to lessen the engineering expenses, a drainage problem may not, in a busy season, receive all of the attention that it merits, and that logical consideration following in the footsteps of an actual examination of the ground, may be replaced by a haphazard or per acre assessment.

A new drain, the extension of an existing municipal drain, or the improvement of an existing natural watercourse is asked for by a petition to the municipal council (Sec. 3). The "last revised roll" governing the status of petitioners in any proceeding under the Act is the roll in force at the time the petition is adopted by the council, and referred to the engineer for enquiry and report (*Challoner vs. Tp. of Lobo*), and the roll is conclusive as to the status of persons mentioned in it,

an assessor's error notwithstanding (McKim vs. Tp. E. Luther). In describing lands included in a drainage scheme an omission of lands from such description is fatal to its sufficiency (South Gower vs. Mountain, Oxford and Edwardsburgh). It is not necessary that a petition should be signed by a majority of the owners whose lands are found by the engineer to be benefited, but it is necessary that a petition should describe a real drainage area, which should bear some reasonable proportion to the size and extent of the drainage scheme (re Duhamel and Tp. of Finch).

Preparation of Report

On receiving the petition with its instructions, the engineer proceeds with the examination and report. The actual design of drains has been dealt with in our association reports at different times, notably in a paper given last year by George A. McCubbin. It is to be noted that in connection with provision made for placing of excavated earth that this earth may not be deposited on the road-bed or travelled portion of a highway, without the express permission of those having jurisdiction over the road (9 Geo. V., c. 19, s. 9), and in planning the course of the drain it is noted that "a drainage work may include such branch drains as may be necessary to render the drainage of the area effective, and the main and branch drains may be regarded as a single scheme or undertaking," and the assessment made accordingly (Mersea vs. Rochester).

Before defining outlet and injuring liabilities, a repetition of the definition of natural watercourse may be pardonable. A natural watercourse or creek is a channel with definite bed and banks formed by the action of water. It is not essential that the supply of water should be continuous, and from a perennial living source. It is enough if the flow arise periodically from natural causes, and reaches a plainly defined channel of a permanent character (in Beer vs. Stroud).

The owner of lands intersected by, or bordering upon, a natural watercourse is known as riparian owner. He has the right to drain artificially through his own place into his own watercourse, and to improve and straighten within certain limits the watercourse on his own lands. This does not render him liable for damages or for assessment for injuring liability (in Tp. of Elma and Tp. of Wallace). This is true even if the result of improved drainage is to increase the amount of water in the stream and flood part of the land of an owner farther

down stream. (McGillivray vs. Tp. of Lochiel). The riparian owner is deprived of his riparian rights upon the watercourse being taken under either of the drainage Acts.

Determining Outlet Liability

The test in determining "outlet liability" under the Act is whether the drainage is necessary in fact or in law to enable or improve the cultivation or drainage of the land proposed to be assessed, and where lands can be more effectively drained after the construction of the drainage work than before because they did not have an outlet before, or when they are effectively drained, but their waters are not taken to a sufficient outlet, so that, legally speaking, they have no outlet at all, and the drainage work will give them an outlet, they are assessable for outlet liability. (Orford and Aldborough).

Where in the course of his examination the engineer finds lands suffering injury from waters brought from upper lands by artificial means, and the proposed work will pick this water up and carry it to a sufficient outlet, he can assess for injuring liability the lands from which the water causing the damage is so artificially brought. The difference between the second kind of outlet liability and injuring liability is that in the former case we have lands seeking outlet, while in the latter lands seek relief. In practice it will often be found difficult to distinguish between these liabilities, but if the assessment which an engineer prepares is consistent, if the total amount charged in the two columns has been arrived at by taking into account the area, elevation, and character of the land, as compared with the remainder of the lands in the area assessed, the designation of which sort of liability will in many cases be unimportant. Any correction, even if called for, would in such a case only mean the adjustment of the amounts in each column. This adjustment the referee is authorized to make. (S. Gower vs. Mountain, Oxford and Edwardsburgh).

In Labute and Tp. of Tilbury N. we have the statement that, "The adoption of the engineer's report was a ratification of his making the report, and therefore equivalent to previous instructions. A subsequent ratification is equal to a prior command. The ratification can be only of an act which the party had the power to command at the time it was done. The ratification will not be effective if the statute requires a previous express mandate." In this we see that, excepting in cases to which the last sentence applies, the indefinite instruc-

tions frequently given by a municipal council may have the result that the manner in which a drainage scheme is carried out, is left to the engineer, and later confirmed by the adoption of the report, although it is preferable to obtain definite instructions after consultation with interested parties and with the council. The "express mandate" applies to the alteration of the proportions of a former assessment schedule. The results of the increased cost of ditching we find are: (1) More private drains are made, frequently diverting water to other outlets than formerly made use of. (2) Drains are repaired less frequently. (3) Since large sums are involved, and since in many parts agriculture is not a prosperous pursuit, the assessment is subjected to the closest scrutiny. These results combine to necessitate in nearly all cases a reconsideration of former assessments, and render it advisable to have carte blanche in the preparing of new assessments, by having the council pass a resolution giving the engineer authority to do so.

There is no reason why the construction of a drain may not be authorized even though it follows in the main the course of an existing drain. Sec. 77 of the Act was designed to afford an alternative mode of effecting the improvement of an existing drain, and to dispense, in the cases with which the section deals, with the necessity of the petition for which Sec. 3 provides. There is nothing in Sec. 77 which excludes the right to proceed under Sec. 3. If an existing drain is made use of for the purpose of the new work, the value of it must be credited to the persons assessed for it in the proportions in which they were assessed. (re Tp. Gosfield S. and Tp. Gosfield N.).

Drainage of Railway Lands

The mode of procedure in carrying on drainage works on railway lands has been very fully dealt with in a paper by Mr. McCubbin in the association report of 1919.

A case which would not frequently be met with, but which is nevertheless interesting, is that in which after the by-law is passed, a part of the area becomes detached from the municipality in which it was situate at the time of the passing of the by-law and is attached to, or formed into a new municipality. Sec. 40 of the Municipal Act covers this case by providing that the work be gone on with, as if no such change had occurred.

The actions for damages due to alleged wrongful application of the Act, and of wrongful diversion of water are many, and the consideration of these necessitates a review of all of the details of each case, but generally speaking all of the latter class of cases depend on the axiom that "a corporation is not bound to prevent natural flow of water on property, but have no right to deposit foreign waters." (Rud. vs. Arnprior).

A municipality's right in disturbing natural drainage and the rights of the property owner are set forth in Section 325 and subsequent sections of the Municipal Act, which provides for the carrying on of any work which the corporation is authorized to perform under the Municipal Act, or any special or general Act, and the settling with owners of property injuriously affected by compensation, the claim for which except in the case of an infant owner or an owner of unsound mind having to be made within one year from the time of the sustaining of the injury or its becoming known. The application of this section is discussed in the interesting case of Wigle vs. Tp. of Gosfield South, which is also illustrative of the principle that a municipality must not divert more water into a stream than it can take care of according to its natural capacity.

Administration of Act

In the administration of this Act, as in all other phases of our professional life, the application of common sense is generally more effective than a too literal interpretation of the Act. We have realized that by calling on all of the parties interested in a scheme, while their stories may in cases differ, yet their having expressed an opinion minimizes futile appeals to the Court of Revision, while at the same time a discussion of the means of best solving the farmer's drainage problem generally results in the engineer gaining an otherwise unobtainable knowledge of conditions.

The engineer's perusal of the reports of cases where procedure under the Act is questioned, is always of value, while decisions in actions for damages, or for injunctions, especially where given by the higher authorities may serve to prevent his leaving a similar loophole in the administration of the Act. Like a set of specifications, an assessment schedule is never perfect, but at the same time affording opportunity for the display of sound judgment, creates occasion for such work as will reflect great credit on its author. The engineer must

be perfectly conversant with those sections up to, and including the Court of Revision procedure, and if he has carried out the intent of the Act, and has by a just and compromising course prevented recourse to legal action, he will find himself more successful in his official capacity than as a would-be solicitor.

DISCUSSION

Mr. Rutherford—One question I would like to ask: What is the definition of a natural water course? I think that would be interesting.

Mr. Anderson—May I answer by saying that Mr. Scott quotes from a case which is most frequently cited. I think it is a judgment of Mr. Justice Street, Beer & Stroud, which is the recognized authority as to a definition of a natural water course, and if Mr. Rutherford will study that paragraph and commit it to memory he will have the proper definition.

LIST OF REGISTERED ONTARIO LAND SURVEYORS, 1924

The names of those members granted commissions since January 1st, 1924, are marked*.
See Section 44, Ontario Land Surveyor Act.

Name and P.O. Address.	Date of Admission by Board.
Abrey, George Spencer, 606 Indian Road, Toronto	6th April, 1906
Allison, Calvin Bruce, South Woodslee	22nd Feb., 1911
D.L.S., Grad. S.P.S.	
Anderson, Herbert McEwan, North Bay	18th April, 1910
Anderson, Ralph Mackenzie, 703 Temple Building, Toronto	2nd May, 1911
Grad. S.P.S.	
Angus, George Page, North Bay	18th April, 1911
Ardagh, Arthur Gowan, Barrie	18th Feb., 1908
Grad. S.P.S.	
Armstrong, Christopher Gillette Russell, 190 Oak Ave., Windsor	19th June, 1924
B.A.Sc.	
Attwood, Charles Hartley, Dom. Water Power Branch, 231 Chamber of Commerce, Winnipeg, Man.	22nd Feb., 1911
D.L.S.	
Aylsworth, Charles Fraser, Madoc	8th Jan., 1886
D.L.S. Engineer Co. Hastings.	
Baird, Alexander, Leamington	7th July, 1877
C.E.	
Baird, John Ainslie, Royal Bank Building, Sarnia	2nd May, 1913
B.A.Sc., City Engineer.	
Baird, Wilmot Johnston, 1194 Danforth Ave., Toronto	22nd Feb., 1912
B.A.Sc., D.L.S.	
Bartley, Thomas Holmes, 22 Willard Ave., Ot- tawa	11th Feb., 1915
B.A.Sc., D.L.S., A.M.E.I.C.	
Bazett, Edward, Huntsville	8th July, 1881
D.L.S.	
Beatty, Frank Weldon, Pembroke	14th Feb., 1920
D.L.S., Grad. S.P.S.	
Beatty, William Benjamin, 16 Glendale Cres- cent, Hamilton	11th Feb., 1915
B.A.Sc., D.L.S.	
Beatty, Herbert John, Pembroke	8th Nov., 1893
Grad. S.P.S.	

Name and P.O. Address.	Date of Admission by Board.
Bell, Frederick Archibald, Court House, St. Thomas	22nd May, 1914 B.A.Sc.
Bell, James Anthony, St. Thomas	11th Oct., 1875 D.L.S., Co. Engineer, Elgin; City Engineer, St. Thomas.
Benner, Frederick James King, Port Arthur..	13th Feb., 1913 D.L.S.
Berkeley, Garnet Lawrence, Hamilton Trust Bldg., 57 Queen St. West, Toronto	17th Jan., 1918 Grad. S.P.S.
Bingham, Edwin Ralph, Fort William	17th Feb., 1906 D.L.S.
Blair, William John, Provost, Alta.	13th Feb., 1904 Grad. S.P.S.
Blandy, Oliver Roland, Room 30, Sun Life Bldg., Hamilton	22nd Feb., 1912
Blyth, John McDonald, 67 East Ave. N., Ham- ilton, Ont.	21st Feb., 1921 B.A.Sc.
Bolton, Ellsworth Doan, Listowel.....	7th Nov., 1899 B.A.Sc. (McGill)
Boswell, Elias John, Hydro-Electric Power Commission, University Ave., Toronto ..	7th Nov., 1896 Grad. S.P.S., D.L.S.
Bowman, Clemens Dersteine, West Montrose.	10th July, 1879
Bowman, E. P., 10 Douglas Street, Guelph ...	17th April, 1907
Bray, Samuel, 229 Argyle Ave., Ottawa ...	6th Jan., 1877 D.L.S., C.E.
Brian, Michael Edward, City Hall, Windsor..	17th Feb., 1906 B.A.Sc.
Brown, George Laing, Morrisburg	19th Feb., 1898 Grad. S.P.S.
Browne, Harry John, 203 Albany Ave., Toronto	6th July, 1872 C.E.
Browne, William Herbert, 18 Toronto Street, Toronto	18th April, 1910
Burwash, Nathaniel Alfred, Department of Highways, University Ave., Toronto	6th May, 1905 D.L.S., Grad. S.P.S.
Bush, Clayton Elgin, Dept. Highways, Uni- versity Ave., Toronto	15th May, 1908 Grad. S.P.S., D.L.S.
Byrne, Thomas Henry, 711½ Sparks St., Ottawa	24th Feb., 1910 R.M.C. Grad.

Name and P.O. Address.	Date of Admission by Board.
Caddy, John St. Vincent, 327 Laurier Ave. East, Ottawa	6th Oct., 1866 D.L.S.
Campbell, Alexander Stuart, 250 Alfred St., Kingston	24th Feb., 1910 Grad. Queen's Univ.,
Campbell, Archibald William, Ottawa, Domin- ion Road Commissioner	10th April, 1885 C.E.
Campbell, Charles Donald, City Engineer, Belleville	19th Feb., 1917 Grad. S.P.S.
Casgrain, Joseph Phillippe Baby, 180 St. James Street, Montreal	5th Jan., 1887 D.L.S., P.L.S. (Que.), C.E., Assoc. Mem. Can. Soc. C.E., Chief Eng. M. & P. J. Ry., Senator.
Cassels, W. Lyttleton, 18 Rideau St., Ottawa..	11th Feb., 1915
Cavana, Allan George, Orillia	8th July, 1887 D.L.S.
Cavana, Ernest Leopold, Orillia	1st July, 1922
Cavell, Edward c/o W. H. Browne, 18 Toronto Toronto	13th Feb., 1913 Grad. S.P.S.
Chase, Albert Victor, Orillia, Box 762	21st April, 1909 A.M.C.S., Grad. S.P.S., D.L.S.
Chipman, Willis, Mail Building, Toronto	4th Oct., 1881 D.L.S., B.A.Sc. (McGill), Mem. Am. Soc. C.E., Mem. Can. Soc. C.E.
Christie, Uriah Wesley, Orangeville	1st March, 1905 B.A.Sc., D.L.S.
Clarke, Fred Fieldhouse, Land Surveys Dept., C. N. R., Montreal	31st March, 1905 D.L.S., Grad. S.P.S.
Code, Abraham Silas, Alvinston	14th April, 1896
Code, Charles Edward, 14 London St., W., Windsor	19th Feb., 1919
Code, Samuel Barber, Smith's Falls	1st May, 1905 Grad. S.P.S.
Code, Thomas George, Cobalt	17th April, 1907
Code, Robert Wilmot, 14 London Street West, Windsor	18th April, 1911
Code, Richard Stanley, Mimico Beach.....	17th April, 1907
Colby, William David, 156 Joseph St.,..... Chatham	18th Feb., 1922 Grad. S.P.S., D.L.S.

Name and P.O. Address.	Date of Admission by Board.
Coltham, George William, Aurora	1st May, 1912
Coltham, James Thomas, Parry Sound	18th April, 1911
Cook, Alfred, 81 6th St., New Toronto	10th March, 1922
Cook, W. A. M., 90 Oxford Street, Toronto	22nd April, 1910
Crouch, Milton Edwin, 371½ Queen St., Niagara Falls, Ont.	11th Feb., 1914
B.A.Sc., D.L.S.	
Dalton, John Joseph, Weston	11th Jan., 1878
D.L.S., D.T.S.	
Davis, Allan Ross, 46 Redpath Ave., Toronto	8th Jan., 1886
B.A.Sc., McGill	
DeMorest, Richard Watson, Sudbury	9th April, 1889
M.E.	
Dickson, James, Rosedale P.O.	6th April, 1867
D.L.S.	
Dobie, James Samuel, Thessalon	21st Feb., 1898
B.A.Sc. (Tor. Univ.). D.L.S.	
Donevan, Frederick James, Morrisburg	1st July, 1922
B.A.Sc., Queen's.	
Dunn, Thomas Hamilton, Dept. of Interior, Ottawa	14th May, 1906
D.L.S., Grad. S.P.S.	
Eadie, Louis Francis, 36 Laughton Ave., Toronto	2nd May, 1913
Grad. S.P.S.	
Ellis, Douglas Stewart, 209 Albert St., Kingston	12th Feb., 1913
Grad. Queen's Univ.	
Empey, John Morgan, c/o Highways Department, St. Marys	16th Feb., 1907
B.A.Sc., D.L.S.	
Esten, Henry Lionel, Continental Life Bldg., Toronto	7th Jan., 1887
Evans, John Dunlop, Trenton	8th July, 1864
M.E.I.C., D.L.S., Asst. Eng. Can. Nat. Ry.	
Fair, John, 165 Colborne St., Brantford	13th April, 1875
Fairbairn, Richard Purdom, 452 Markham St., Toronto	7th Oct., 1876
Deputy Minister Dept. of Pub. Works, Ontario.	
Fairchild, Charles Court, Cor. Colborne and Market Streets, Brantford	9th April, 1894
Grad. S.P.S.	
Fairchild, William Howard, Galt	17th Feb., 1909

Name and P.O. Address.	Date of Admission by Board.
Falls, Orville Mervon, 525 Rushton Road, Toronto	10th March, 1922 B.A.Sc.
Farley, Sidney Edward, 18 Rideau Street, Ot- tawa, Road Engineer, Co. Carleton	21st April, 1909 P.L.S.
Farncomb, Frederick William, 213 Dundas St., London	6th Nov., 1889
Ferguson, George Hendry, 371 Spadina Rd., Toronto	19th June, 1924 D.L.S.
Fitton, Charles Edward, 9 Ridout Ave., Toronto	10th April, 1879 D.L.S.
Fitzgerald, James William, 435 George Street, Peterborough	13th Feb., 1904
Fitzgerald, Edward, Canadian National Ry., Land Survey Dept., Toronto	11th May, 1915 Grad. McGill Univ.
Flater, Frederick William, 117 William St. N., Chatham	9th April, 1888
Fletcher, William Jessamine, 47 Labelle Bldg., Windsor	21st May, 1915 Grad. Queen's Univ.
*Flint, Ivan Iliffe, 318 Continental Life Bldg., Toronto	3rd April, 1924
Flook, Samuel Evert, Port Arthur	13th Feb., 1913 Grad. S.P.S.
Fuce, Edward Oliver, not known	17th Feb., 1906
Fullerton, Charles Herbert, Parliament Build- ings, Toronto	7th May, 1906 Supt. Colonization Roads, D.L.S., Grad. S.P.S.
Fulton, William Joseph, 414 Quebec Avenue, Toronto	1st April, 1920 B.A.Sc.
Galbraith, William, Bracebridge	4th April, 1883 D.L.S.
Gallagher, Charles Vincent, South Porcupine..	11th Feb., 1915
Gardiner, Edward, St. Catharines	6th Jan., 1866 D.L.S.
Gaviller, Maurice, Collingwood, Box 501	6th Jan., 1866 C.E. (McGill) D.L.S.

Name and P.O. Address.	Date of Admission by Board.
Gibson, Colin William George c/o Gibson, Levy & Gibson, Hamilton	13th Feb., 1913
Grad. R.M.C., Grad. Osgoode Hall.	
Gibson, Harold Holmes, 415 Annette Street, Toronto	8th Sept., 1891
Gibson, Morton Milne, Whitby	22nd Feb., 1912
Grad. S.P.S.	
Gibson, Wilbert Silas, 1851 Yonge St., Toronto.	21st Feb., 1898
Gilbert, Frederick Arthur, 45 Jarvis Street, Toronto	21st Feb., 1921
Gillies, Archibald, Timmins, Ont.	15th Nov., 1920
B.A.Sc. (Toronto Univ.)	
Gill, James Richard, Sudbury	13th Feb., 1913
B.A.Sc. (Toronto Univ.)	
Gillon, Douglas John, Fort Frances	9th Nov., 1895
Grad. R.I.E. Coll.	
Gourlay, Robert Murray, Hydro-Electric Power Commission, University Ave., Toronto...	22nd Feb., 1912
Grant, Russell Reeve, 302 Avenue Road, Toronto	23rd March, 1911
Grad. S.P.S.	
Grassie, Charles Andrew, Smithville, Ont....	1st July, 1922
D.L.S.	
Gray, Andrew Wellington, 64 King St. E., Brockville, Ont.	1st July, 1922
*Gray, Maxim Theodore, 9 Delaware Avenue, Hamilton	20th March, 1924
Greenlees, Alexander Hunter, 81 Victoria St., Toronto	21st April, 1909
Griffin, Albert Dyke (not known)	11th Nov., 1890
B.A.	
Griffin, Campbell, 139 Springhurst Ave., Toronto	17th Aug., 1923
Hagedorn, Grover Cairns, 26 Bingeman St., Kitchener	10th March, 1922
B.A.Sc.	
Halford, Abraham Joseph Bartholomew, 11 Lowther Ave., Toronto	10th April, 1885
Chief Engineer Public Works, Ontario.	
Hogarth, George, Department of Highways, University Ave., Toronto	22nd Feb., 1912
Chief Engineer, Dept. of Highways. Grad. S.P.S.	

Name and P.O. Address.	Date of Admission by Board.
Howard, Charles John Benedictus, 36 Rosehill Ave., Toronto	13th Feb., 1913
D.L.S.	
Howe, John Parnell, Pembroke	3rd May, 1920
D.L.S., B.A.Sc. (McGill), Town Engineer.	
Huffman, Karl, 292 Wright Ave., Toronto....	11th Feb., 1914
D.L.S., Grad. S.P.S.	
Hutcheon, James, Parliament Bldgs., Toronto.	10th Nov., 1891
Inspector of Surveys, Grad. S.P.S.	
Ireson, Edward Taylor, 1857 Danforth Ave., Toronto	21st May, 1915
B.A.Sc.	
Jackson, Alan Mair, City Hall, Brantford....	15th April, 1912
Jackson, John Edwin, 164 Cumberland Ave., Hamilton	22nd Feb., 1911
D.L.S., Grad. S.P.S.	
Jackson, John Herbert, Queen Victoria Park Commission, Niagara Falls	16th Feb., 1901
Jackson, Percival Anthony, Department of Mines Parliament Bldgs., Toronto	11th Feb., 1914
James, Darrell Denman, 23 Scott St., Toronto.	3rd Nov., 1891
D.L.S., B.A., B.A.Sc. (Toronto Univ.).	
Jepson, William Charles, Niagara Falls, Ont...	1st April, 1922
Johnston, Herbert, 63 Frederick Street, Kitchener	21st Feb., 1905
Grad. S.P.S.	
Johnston, Sidney Munnings, 39 Caledonia St., Stratford	9th Nov., 1895
B.A.Sc. P.L.S. (B.C.). Town Engineer, Goderich.	
Jones, Charles Albert, Petrolea	8th April, 1881
D.L.S.	
Jupp, Albert Ernest, 47 Sparkhall Avenue, Toronto	22nd Feb., 1911
Grad. S.P.S.	
Kenny, Carmen Rice, 612 Queen Street, Sault Ste. Marie, Ont.	21st May, 1913
King, John Albert Shirley, 18 Broadway Ave., Ottawa	21st Feb., 1921
D.L.S. Grad. Queen's Univ.	
Kirkup, Roy Stanley, 501 Whalen Building, Port Arthur	30th April, 1914
Laird, James Stewart, Essex	6th April, 1867
D.L.S.	
Lane, Frederick Carleton, Sudbury	22nd Feb., 1912

Name and P.O. Address.	Date of Admission by Board.
Lang, John Leiper, Sault Ste. Marie B.A.Sc. (Tor. Univ.), D.L.S.	2nd May, 1908
Lanning, John, Cochrane B.A.Sc.	8th April, 1920
Lanzon, Silvio, 103 Gates Ave., Toronto	1st April, 1922
Lee, Roger Melville, Temple Bldg., Brantford D.L.S., S.L.S.	19th April, 1910
Leitch, John Strickland, Dept. of Public Works, Parliament Buildings, Toronto D.L.S.	11th Feb., 1915
leMay, Tracy Deavin, Toronto City Hall M.E.I.C., City Surveyor.	11th May, 1909
Lewis, John Bower, 15 Sparks Chambers, Ot- tawa	4th Oct., 1883
	D.L.S., P.L.S. (Quebec), C.E.
Lloyd, Norval Clarence, 576 Jones Avenue, Toronto	22nd Feb., 1912
	Grad. S.P.S.
Low, Edward Hamilton, Fort Frances	17th Feb., 1902
	Grad. R.M.C. (Kingston).
Lumb, William Ewart, Bancroft	17th Feb., 1916
	Grad. Queen's Univ.
Lumsden, Hugh David, Orillia	4th Jan., 1866
	C.E., D.L.S., M.I.C.E., Mem. Can. Soc. C.E.
Lyon, Charles Richard, 75 Osler Avenue, Toronto	1st April, 1923
MacDonald, James Atwood, Ridgetown	20th Feb., 1918
	Grad. S.P.S.
MacKay, James John, Home Bank Building, Hamilton	24th Feb., 1899
MacKay, Ernest George, Home Bank Building, Hamilton	13th Feb., 1913
	Grad. S.P.S., D.L.S.
MacRostie, Norman Barry, 15 Sparks Cham- bers, Ottawa	11th Feb., 1914
	D.L.S., B.A., B.Sc.
McAuslan, Herbert James, North Bay	19th Feb., 1916
	D.L.S., B.A.Sc., Toronto.
McColl, Charles Ross, Suite 6, Gas Building, Windsor	4th May, 1909
	Grad. S.P.S.
McCubbin, George Albert, Box 389, Chatham..	9th Nov., 1895
McDougal, Samuel George, 128 Wellington St., Ottawa	11th Feb., 1914

Name and P.O. Address.	Date of Admission by Board
McDowall, Robert, Owen Sound	11th Nov., 1890
Grad. S.P.S., Town Engineer.	
McFarlen, George Walter, City Engineer's Office, Toronto City Hall	11th Nov., 1889
Grad. S.P.S.	
McGarry, Patrick Joseph, 26 Theresa St., Kitchener	22nd Dec., 1919
Grad. S.P.S.	
McGeorge, William Graham, 129 William St., Chatham, President, O. L. S.	22nd Feb., 1911
County Engineer, Grad. S.P.S., D.L.S.	
McGregor, James Martin, Box 254, Glencoe . .	22nd Feb., 1912
Grad. S.P.S.	
McLean, William Arthur, Parliament Buildings, Toronto	21st Feb., 1898
Am. Can. C.E. Soc., Deputy Minister of Highways.	
McLennan, Murdoch John, Williamstown . . .	13th Nov., 1893
B.A.Sc. (McGill), D.L.S.	
McMeekin, Albert, Kenora	22nd Feb., 1911
B.A.Sc. (McGill), D.L.S.	
Malcolm, William Lindsay, 196 Union Street, Kingston	22nd Feb., 1912
M.B., B.Sc., Queen's Univ.	
Malcolmson, Walter S., not known	2nd May, 1913
Manser, Charles J., 1142 Queen Street West, Toronto	15th Feb., 1915
Manton, Lewis Goodwin, 233 Davisville Ave., Toronto	14th Feb., 1920
Marshall, Joseph, 165 Shaw St., Toronto . . .	12th May, 1921
Matheson, Hugh, Box 1524, Sudbury	17th Feb., 1916
D.L.S., Grad. Queen's Univ.	
Matheson, Alexander, Swastika	14th Feb., 1920
Meador, Charles Herbert, Colonization Roads, Parliament Buildings, Toronto	18th Aug., 1917
Grad. S.P.S., B.A.Sc.	
Miller, Frederick Fraser, Napanee	8th Jan., 1885
B.A.Sc., M.E.I.C., D.L.S.	
Mooney, Lincoln, Sudbury	27th April, 1918
Moore, Edgar Lawrence, North Bay	1st May, 1916
Moore, John MacKenzie, 489 Richmond Street, London	9th Oct., 1879
Moore, John Harrison, Smith's Falls	11th Nov., 1889
D.L.S., Grad. S.P.S.	

Name and P.O. Address.	Date of Admission by Board.
Moore, William James, Town Engineer, Pembroke	18th Feb., 1908
Grad. S.P.S.	
Monteith, James Clarence, 39 Prospect Street, Port Arthur	June 1st, 1924
D.L.S.	
Morris, James Lewis, Pembroke	7th July, 1886
D.L.S., C.E. (Toronto Univ.).	
Morris, Alfred Edmund, Perth, Ont.	10th April, 1879
Muckleston, Francis Herbert, 10 Woodycrest Ave., Toronto	11th March, 1914
Nash, Abram Stanley Leland, Temple Build- ing, Brantford	1st May, 1915
Neelands, Ernest Wesley, New Liskeard	16th Feb., 1909
Grad. S.P.S.	
Newman, John James, Davis Block, Windsor..	12th Nov. 1892
Grad. S.P.S.	
Ord, Lewis Redman, 133 Blake St., Barrie	8th April, 1885
Patten, Thaddeus James, Little Current	5th Jan., 1883
Patterson, Frank Elliott, 71½ Spark Street, Ottawa	21st April, 1909
Grad. S.P.S.	
Peckover, Horace Joseph, c/o Peckovers Ltd., West Market St., Toronto	24th Feb., 1910
D.L.S., B.A.Sc., Toronto.	
Pequegnat, Marcel, 239 Frederick St., Kitch- ener	24th Feb., 1910
B.A.Sc., Toronto, D.L.S.	
Perrie, William Wallace, Box 109, Regina, Sask.	19th Feb., 1917
Phillips, Edwin Percy Argall, Port Arthur ...	24th Feb., 1910
Grad. S.P.S.	
Pierce, John Wesley, 177 Carling Ave., Ottawa	20th Feb., 1909
D.L.S.	
Pinhey, Charles Herbert, 53 Queen St., Ottawa	12th Nov., 1888
D.L.S., Grad S.P.S., Assoc. Mem. Can. Soc. C.E.	
Proudfoot, Hume Blake, 132 Roxborough St. W., Toronto	6th Jan., 1882
S.L.S., D.L.S.	
Purser, Ralph Clinton, 211 Fifth Ave., Ottawa.	21st May, 1921
D.L.S.	

Name and P.O. Address.	Date of Admission by Board.
Rainboth, Edward Joseph, 488 MacLaren St., Ottawa	11th Nov., 1887 D.L.S.
Ramsey, Guy Lawrence, Sault Ste. Marie	13th Feb., 1913 B.A.Sc. (Toronto University).
Ransom, John Thomas, 34 Victoria St., Toronto	22nd Feb., 1911 D.L.S., B.A.Sc.
Reuben, Cyril George, 30 Bracken Ave., To- ronto	12th May, 1921
Richards, Geo. Henry, Temple Bldg., Brantford	1st April, 1923
Ritchie, Nelson Thomas, 125 Lipton St., Winnipeg	9th Nov., 1888
Robertson, James, 1170 Yonge St., Toronto...	11th July, 1885 Grad. S.P.S.
Roger, John, Mitchell	10th Nov., 1888 Grad. S.P.S.
Rolfson, Orville, 99 Farnham Ave., Toronto..	11th Feb., 1915 Grad. S.P.S., D.L.S.
Rorke, Louis Valentine, Parliament Buildings, Toronto	14th April, 1890 Director of Surveys, Ontario, D.L.S.
Ross, George, Welland	10th July, 1879 B.A.Sc. (McGill), D.L.S.
Ross, Kenneth George, Sault Ste. Marie	15th May, 1909 Grad. S.P.S.
Routly, Herbert Thomas, 109 Lytton Boule- vard, Toronto	1st May, 1907 Grad. S.P.S., D.L.S., A.M.C.E.
Rubidge, Walter Frederick Brendon, Port Credit	15th April, 1912 Grad. S.P.S.
Rutherford, Frank N., 24 Queen Street, St. Catharines	18th May, 1906 Grad. S.P.S.
Scott, John Russell, Welland	21st Feb., 1921 Engineer, County of Welland.
Sewell, Henry De Quincy, 53 Craighurst Ave., Toronto	9th July, 1885 D.L.S., A.M.C.E.
Sewell, Henry Charles De Quincy, 105 St. James Chambers, Toronto	2nd May, 1913

Name and P.O. Address.	Date of Admission by Board.
Sibbett, William Algernon, 56 Lyall Avenue, Toronto	6th May, 1912 Grad. S.P.S.
Silvester, George Ernest, 16 Lauder Avenue, Toronto	12th Nov., 1892 Grad. S.P.S.
Slater, Nicholas James, 10 Sparks Chambers, Ottawa	22nd Feb., 1911
Smith, Campbell Taylor, 24 Queen St., St. Catharines	1st April, 1922 B.A.Sc.
Smith, Oliver, Lindsay	15th Feb., 1916
Snow, Ernest Arthur, Box 711, Kitchener	18th April, 1910
Seymour, Horace Llewellyn, 81 Victoria St., Toronto	2nd May, 1908 Grad. S.P.S., D.L.S.
Speight, Thomas Bailey, 703 Temple Building, Toronto	6th Jan., 1882 Chairman of O.L.S. Council, D.L.S.
Stewart, Lionel Douglas Noble, Collingwood . .	24th Feb., 1910 Grad. S.P.S.
Stewart, Walter Edgar, Aylmer, Ont.	12th April, 1892
Street, James Cunard, Welland Ship Canal, Welland	11th May, 1912 Grad. S.P.S.
Stull, William Walter, Sudbury	17th Feb., 1900 B.A.Sc. (Toronto Univ.).
Summers, Gordon Foster, Haileybury	11th May, 1908 D.L.S., B.A.Sc.
Sutcliffe, Homer Wilson, New Liskeard	11th May, 1908 Grad. S.P.S.
Tate, Henry William, 35 Yonge St., Toronto .	30th April, 1911
Taylor, William Emerson, 22 Falcon Street, Toronto	22nd Feb., 1911 D.L.S., B.A.Sc.
Taylor, William Vernon, City Hall, Sarnia	7th Nov., 1896
Townsend, David Thomas, C.P.R., Land Dept., Calgary	17th Feb., 1906 D.L.S., B.A.Sc., Toronto.
Traynor, Isaac, Dundalk	16th April, 1873 D.L.S.

Name and P.O. Address.	Date of Admission by Board.
Tyrrell, James Williams, Prov. & Loan Chambers, 7 Hughson St. South, Hamilton	8th April, 1885
C.E. (Toronto Univ.), D.L.S., Eng. for Wentworth.	
Ure, Douglas Gordon, 76 Graham St., Woodstock	15th March, 1922
B.A.Sc., Toronto.	
Ure, Frederick John, Woodstock	7th April, 1887
D.L.S.	
Ure, Wilfred Gordon, Woodstock	14th Feb., 1920
B.A.Sc., Toronto.	
van Nostrand, Arthur J., 703 Temple Building, Toronto	30th Oct., 1882
D.L.S.	
van Nostrand, John, 703 Temple Bldg., Toronto	1st May, 1910
Grad. S.P.S., D.L.S.	
Wadsworth, Vernon Bayley, Bank of Toronto Bldg., King St. W., Toronto	9th April, 1864
D.L.S.	
Walker, Alfred Paverley, 266 Rusholme Road, Toronto, C.P.R. Div. Surveyor	6th Jan., 1882
D.L.S., Mem. Can. Soc. C.E.	
Ward, Acheson Thomas, 703 Temple Building, Toronto	10th April, 1897
Ward, Norman Everett, 100 Ontario Ave., Hamilton	24th April, 1922
Waddell, Frank Melbourne, 349 St. Paul Ave., Brantford	1st April, 1922
Watson, John McCormack, P.O. Box 224,	
Orillia	13th April, 1892
Webster, Frederick Theodore, 36 Peel St., Lindsay	
Weir, David Henry, Winchester	15th March, 1922
B.A.Sc. Grad.	
Wheelock, Charles Richard, Orangeville.	7th Jan., 1886
Treasurer, County of Dufferin.	
White, Walter Russell, Dept. of Indian Affairs, Ottawa	13th April, 1913
Grad. S.P.S., D.L.S.	
Wiggins, Thomas Henry, Box 139, Napanee.	10th Nov., 1891
Grad. S.P.S.	
Wilkins, Claude Hughes, Hastings	17th Feb., 1916

Name and P.O. Address.	Date of Admission by Board.
Wilkie, Edward Thomson, 56 Marmaduke St., Toronto	11th April, 1891 D.L.S.
Wilson, Norman Douglas, 315 Hamilton Trust Bldg., 57 Queen St. W., Toronto.....	24th Feb., 1910 B.A.Sc., D.L.S., A.M. Can. Soc. C.E.
Winters, William Selwyn, 1857 Danforth Ave., Ottawa	15th April, 1912 Grad. S.P.S.
Young, Alex. Campbell, 119 Belmont Avenue, Toronto	16th Mar., 1915 .
Yates, Charles Robert, 19 Cassels Ave., Toronto	12th May, 1921

Certified correct, April 1st, 1924.

TRACY D. leMAY,
Registrar.

REGISTERED AND WITHDRAWN FROM PRACTICE.

Name and P.O. Address.	Date of Admission by Board.
Anderson, John Drummond, Trail, B.C.	13th April, 1892
Anderson, William Beaumont, Halifax, N.S... Grad. R.M.C., B.A.Sc. (McGill), M. Can. Soc. C.E., D.L.S., R.C.E	14th Feb., 1903
Apsey, John Fletcher, not known Grad. S.P.S.	6th Jan., 1886
Aylesworth, John Sydney, R. R. No. 2, Roblin, Ont.	9th Jan., 1877
Baker, Mason Herman, 166 St. Leonard Ave., Toronto Grad. S.P.S.	16th Feb., 1909
Blake, Frank Lever, Meteorological Observat- ory, Toronto Grad. S.P.S.	13th April, 1875
Bowman, Arthur Meyer, Mahan, Beaver Co., Pa. Grad. S.P.S., Staff of U.S. Engineers.	11th Nov., 1887
Bowman, Franklin Meyer, Belleville, 1234 North Highland Ave., Pittsburg, Pa. Grad. S.P.E., Engineer Structural Iron Works.	11th April, 1892
Brown, John Alexander, West Vancouver....	22nd Feb., 1911
Burd, James Henry, Sudbury, Ont. Grad. S.P.S.	2nd Oct., 1905
Burgess, Edward LeRoy, Kamloops, B.C. D.L.S., A.L.S., B.C.L.S.	6th May, 1905
Burnet, Hugh, Victoria, B.C. D.L.S., P.L.S. (B.C.).	5th April, 1887
Burt, Frederick Percy, New York	8th July, 1885
Burwell, Herbert M., Vancouver, B.C.	8th Oct., 1876
Butler, Matthew Joseph, Oakville C.E., LL.B., C.M.G., M.I.C.E., Mem. Can. Soc. C.E., Mem. Am.Soc. C.E.	11th Jan., 1878
Chartrand, Donat Emile, Topographical Sur- veys Branch, Ottawa D.L.S.	19th Feb., 1917
Cambie, Henry John, c/o C. P. R. Office, Van- couver, B.C. D.L.S., P.L.S. (B.C.).	8th July, 1861
Carbert, J. Alfred, Medicine Hat D.L.S., Dist. Eng. and Surveyor.	4th April, 1876
Carpenter, Henry Stanley, Regina, Parliament Buildings D.L.S., B.A.Sc., Toronto.	25th Feb., 1899

Name and P.O. Address.	Date of Admission by Board.
Carroll, Cyrus, Stratford Apartments, 108 East Ave. South, Hamilton	10th Jan., 1860 Mem. Can. Soc. C.E., D.L.S.
Crerar, Samuel Rutherford, Faculty Applied Science, Toronto University	1st March, 1906 D.L.S., B.A.Sc.
Chalmers, John, Edmonton, Alta.	11th April, 1896 Grad. S.P.S., Structural Engineer, Dept. Pub. Works.
Charlesworth, Lionel Clare, Edmonton, Alta..	14th April, 1896 Grad. S.P.S., Director of Surveys, Alberta, D.L.S.
Coleman, Richard Herbert, 1170 Yonge Street, Toronto	6th Oct., 1877
Deacon, Thomas Russ, Winnipeg	12th Nov., 1892 Grad. S.P.S.
Deans, William James, Brandon, Man.	11th July, 1884 Grad. S.P.S.
Dempster, Hubert Orville, Nelson, B.C. Hydro- graphic Survey	24th Feb., 1910 Grad. S.P.S.
Dixon, Howard A., Winnipeg, Man.	14th Feb., 1903 Chief Engineer, C. N. Ry. Grad. S.P.S.
Drewry, William Stewart, 727 Linden Avenue, Victoria	5th April, 1883 D.L.S.
Ducker, William A., Winnipeg, Man.	6th April, 1882 D.L.S., P.L.S. (Man.), Swamp Lands Commissioner.
Ellis, Henry Disney, 30 Blackheath Park, Lon- don, England	7th April, 1877 D.L.S.
Farrell, King Allen, 481 West Marion Street, Toronto	21st May, 1915 Grad. S.P.S.
Ford, William Butterfield, Can. Eng. & Contracting Co., Hamilton	21st Feb., 1898
Gibbons, James, Ottawa, Dept. of the Interior.	15th April, 1890 Grad. S.P.S., Dom. Top. Surveyor.
Gibson, George, St. Catharines	10th April, 1860 D.L.S.
Green, Thomas Daniel, Rocky Mountain House, Alta.	7th Jan., 1885 B.A.Sc. (McGill), D.L.S., A.L.S.

Name and P.O. Address.	Date of Admission by Board.
Hanes, George Samuel, 144 3rd St. W., City Engineer, North Vancouver, B.C.	6th May, 1905 Grad. S.P.S.
Harris, John Walter, 801 Somerset Bldg., Win- nipeg, Man.	6th Oct., 1866 M.L.S. (Man.), D.L.S., Mem. Can. Soc. C.E.
Harvey, Thomas Alexander, 239 Vernon Ave., Long Island, New York City	13th Nov., 1893
Heaman, John Andrew, G.T.P. Ry., Winnipeg.	16th Nov., 1896
Henderson, Eder Eli	7th Oct., 1885 Grad. S.P.S.
Hermon, Ernest Bolton, Bank of Hamilton Bldg., Vancouver, B.C.	7th Oct., 1885 Grad. S.P.S., P.L.S. (B.C.), D.L.S.
Henry, Frederick J., 33 Becker St., London...	7th April, 1887
Innes, William Livingstone, Simcoe	14th April, 1892 C.E. (Toronto Univ.).
Jephson, Richard Jermy, Brandon, Man.	7th April, 1877 B.C.L.S., D.L.S., M.L.S.
Johnson, Sydney Munnings, Stratford	9th Nov., 1895 Grad. S.P.S.
Johnston, William James, 1816 Waterloo Road, Vancouver	10th May, 1910 Grad. S.P.S.
Johnston, Robert Thornton, 10515—223rd St., Queens, New York	9th April, 1889
Jones, George Samuel, 215 5th Ave., Ottawa..	21st April, 1909 Grad. S.P.S.
Kennedy, James Henry, Keremeos, B.C.	7th April, 1887 C.E. (Toronto Univ.), Chief Engineer V. V. & E. R. & N. Co.
Kirk, John Albert, Summerland, B.C.	6th July, 1877 D.L.S., P.L.S. (B.C.).
Lawrence, Charles Albert Rutter, C/o Dept. Interior, Thomas Block, Calgary, Alta....	21st Feb., 1921 D.L.S.
Lougheed, Aaron, Port Arthur	12th Nov., 1888
Lyon, John Edward, Dept. Militia and Defence, Ottawa	3rd May, 1920
MacPherson, Duncan, Ottawa	9th Jan., 1884 Grad. R.M.C., M.I.C.E., Mem. Can. Soc. C.E., Div. Eng. D.L.S.
McCaw, Robert Daniel, 235 Howe St., Victoria	16th Feb., 1907
McCulloch, Andrew Lake, Nelson, B.C.....	10th Nov., 1888 Grad. S.P.S., Assoc. Mem. Can. Soc. C.E.

Name and P.O. Address.	Date of Admission by Board.
McGrandle, Hugh, Wetaskiwin, Alta. D.L.S.	5th Jan., 1883
McKnight, James Henry, Simcoe D.L.S.	22nd Jan., 1919
McNab, John Duncan, not known D.L.S.	9th Oct., 1879
McNaughton, Findlay Donald, Strathmore, Alta.	25th Feb., 1899
McMullen, William Ernest, Dept. Lands and Forests, Fredericton, N.B.	11th Nov., 1892
McPherson, A. J., 203 Sterling Trust Building, Regina Grad. S.P.S.	10th April, 1897.
McPherson, Charles Wilfred, Chatham, Ont... D.L.S.	21st Feb., 1899
Magrath, Charles Alexander, International Waterways Commission, Ottawa Chairman I.W.C., B.A.Sc. (McGill), D.L.S., P.L.S. (B.C.).	1st Nov., 1907
Marck, Joseph Albert, La Romana, Santa Do- mingo D.L.S.	11th Feb. 1915
Marshall, James, Blyth P.O. D.L.S.	6th Oct., 1866
Meadows, William Walter, c/o Director of Sur- veys, Regina D.L.S., Grad. S.P.S.	21st Feb., 1898
Montgomery, Royal Harp, Prince Albert, Sask. Grad. S.P.S., D.L.S.	6th May, 1905
Mountain, George Alphonse, Ottawa Mem. Can. Soc. C.E., D.L.S., P.L.S. (Que.). Eng. Dom. Railway Commission.	9th Jan., 1884
Munro, John Vicar, 489 Richmond Street, London D.L.S.	9th April, 1895
Murdie, William Campbell, c/o Geodetic Sur- vey, Ottawa D.L.S.	1st April, 1923
Neville, Everett Arthur, 1320 Dougall Ave., Windsor D.L.S.	19th Feb., 1917
Ney, Cecil Herman, c/o Geodetic Survey, Ot- tawa D.L.S.	1st April, 1923
Norrish, Wilbert Henry, Topographical Sur- vey Branch, Ottawa Grad. Queen's Univ.	11th Feb., 1915
Paterson, James Allison, 53 Erie Ave., Ham- ilton C.E., Mem. Can. Soc. C.E.	5th April, 1878

Name and P.O. Address.	Date of Admission by Board.
Pearce, William, Calgary, Alta.	12th Oct., 1872
D.L.S., P.L.S. (B.C.), Asst. B.C. Land Com. for C.P.R.	
Parsons, Johnston Lindsey Rowlett, Regina, Sask.	6th May, 1905
C.M.G., D.S.O., D.L.S., Grad. S.P.S.	
Paulin, Frederick William, Bank of Hamilton Chambers, Hamilton	11th May, 1908
Grad. S.P.S.	
Reiffenstein, James Henry, Ottawa, Dept. of the Interior	16th April, 1873
D.L.S.	
Reilly, William Robson, 512 Westman Cham- bers, Regina, Sask.	7th April, 1881
D.L.S., P.L.S. (Man.).	
Reinhardt, Carl, Box 303, Cobalt	25th Feb., 1899
B.A.Sc. McGill.	
Riddell, John Morrison, Geodetic Survey, Ottawa	9th Feb., 1916
D.L.S.	
Roberts, Vaughan Maurice, c/o Harbor Com- mission, Toronto	5th April, 1887
D.L.S.	
Robinson, Edward Keith, 142 Lower Albert Street, Kingston	19th April, 1917
Grad. Queen's Univ.	
Rogers, Richard Birdsall, Peterborough	9th Jan., 1879
B.A.Sc. (McGill), D.L.S.	
Rogers, Alec., 48 Emmett St., Ottawa	22nd Feb., 1911
Ross, Joseph Edmund, Kamloops, B.C.	11th Nov., 1890
Grad. S.P.S., D.L.S., P.L.S. (B.C.)	
Sanderson, Daniel Leavens, Coral, Mich.	4th Oct., 1892
Saunders, Bryce Johnston, Edmonton, Alta... ..	7th Jan., 1885
B.A.Sc. (McGill), D.L.S.	
Seibert, Frederick Victor, Topographical Sur- veys, Ottawa	22nd Feb., 1912
Grad. S.P.S.	
Shaw, Charles Aeneas, Greenwood, B.C.	6th Oct., 1877
P.L.S. (B.C.).	
Sherman, Ruyter Stinson, 3642 Powell Street, Vancouver, B.C.	12th April, 1890
Slater, Nicholas John, 10 Sparks Chambers, Ottawa	22nd Feb., 1911
B.Sc. (McGill)	

MEMBERS REGISTERED AND WITHDRAWN FROM PRACTICE. 269

Name and P.O. Address.	Date of Admission by Board.
Smith, Angus, 3623 Boulevard, Elbow Park, Calgary	14th April, 1896 Grad. S.P.S., City Engineer.
Smith, Henry, Cor. Oxford St. and Bellevue Ave., Toronto	8th Nov., 1861 D.L.S., Mem. Can. Soc. C.E.
Steele, Ira John, 18 Rideau Terrace, Ottawa...	18th April, 1910
Stewart, Elihu, 9 College Street, Toronto.....	8th April, 1872 Spruce Falls Pulp Co., D.L.S.
Stewart, Louis Beaufort, Faculty of Applied Science, Toronto University, Toronto....	6th April, 1882 Dom. Top. Surveyor, Professor of Surveying.
Stewart, John, Calgary, Alta.	11th Nov., 1878 D.L.S.
Tracey, Thomas Henry, 744 Butte Street, Van- couver, B.C.	8th April, 1870 C.E., P.L.S. (B.C.), D.L.S.
Turnbull, Thomas, C. N. Ry., Winnipeg	6th July, 1878
Vicars, John Richard Odium, Kamloops, B.C..	5th Jan., 1887 P.L.S. (B.C.), D.L.S.
Wallace, James Nevil, Calgary, Alta.	21st Feb., 1898 D.L.S., B.A., B.E. (Trin. Coll., Dublin).
Webster, William Gourlay, York and Adelaide Sts., London, Ont.	22nd Feb., 1912
Weekes, Abel Seneca, Glencoe	12th April, 1890 D.L.S.
Wheeler, Arthur Oliver, Sidney, B.C.	8th July, 1881 P.L.S. (B.C.), D.L.S., Topographer, Dept. of Interior.
Wicksteed, Henry King, 178 Glen Road, Toronto	7th Jan., 1886 B.A.Sc. McGill.
Wells, Frederick Arthur, Confederation Life Bldg., Toronto	17th Feb., 1906 Grad. S.P.S.
Wilkins, Frederick William, Norwood.....	6th Jan., 1877 D.L.S., D.T.S.

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surveyors, Toronto.
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Association of Ontario land survey
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